

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING



Service to relieve remote access pain

By Denise Pappalardo
Las Vegas

Concentric Network Corp. this week will branch out beyond its Internet service provider roots and roll out a remote access service that addresses two key issues: security and cost.

In addition to letting you out-source your remote access headaches, Concentric RemoteLink allows you to authenticate dial-in users via a Remote Authentication Dial-in Users Service (RADIUS) server. The service also includes software that helps remote users locate nearby Concentric access points, a trick that can reduce your line charges by more than 50%, as compared to

See Remote, page 122

NETWORK+INTEROP 97

SHOW-RELATED STORIES

- Netscape Directory Server 3.0 beta to debut. **Page 8.**
- Nortel makes voice/data integration more affordable. **Page 10.**
- Network management to roll out. **Page 19.**
- MPOA goes on display. **Page 37.**
- 3Com attempts to simplify virtual LANs. **Page 42.**

Critics question NIA's credibility

By Jim Duffy and Jodi Cohen

Two weeks from its first anniversary, the Network Interoperability Alliance (NIA) is struggling to win credibility.

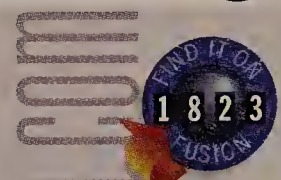
The group was formed by IBM, 3Com Corp. and Bay Networks, Inc. to push multivendor interoperability among internet-work products. But it is still viewed as a private club formed to snub Cisco Systems, Inc., the dominant player in the market. Even though the NIA has completed a couple of interoperabil-

ity tests, with a few more slated for this year, users and analysts said the testing is largely irrelevant without participation by Cisco and other vendors.

"NIA is mostly smoke," said Don Miller, an analyst at Dataquest, Inc. in San Jose, Calif. "There are too few vendors participating in this thing for it to really count."

"I don't think the NIA is effective, since vendors like Cisco are missing," said a net manager from a resort in the Northeast that last year publicly endorsed the NIA... before adding lots of Cisco gear to its net. "We have a multivendor envi-

See NIA, page 122



Get more info online:

- Details of what the NIA promised last year
- A copy of a column that praised the alliance
- NIA member lists and papers

WEB WATCH PART TWO

The PRESSURE mounts

The grace period is over for the three young companies being profiled in our "Web Watch" series. All three firms are now touting new products in the face of competition and buyer resistance. Find out how BackWeb, HAHT and Novera are faring and what their progress means to you. For the second installment of this series, see page 126.



PHOTOS (TOP TO BOTTOM) CINDY CHARLES, CHARLES GUYTON, STELLA JOHNSON

ISP peering boosts reliability

By Denise Pappalardo

When it comes to winning your Internet access business, the big carriers go at each other tooth and nail. But behind the scenes, the Internet service providers are getting chummier all the time.

Increasingly, ISPs such as MCI Communications Corp. and Sprint Corp. are deploying high-speed links among their networks. The links enable them to exchange Internet traffic without going through the overcrowded hubs that handle the bulk of 'Net traffic today. These so-called private peering arrangements promise to improve service reliability and help the carriers prepare to offer quality-of-service (QoS) guarantees to corporate customers.

Private peering connections let ISPs sidestep the network access points (NAP) and metropolitan-area exchanges (MAE). The NAPs and MAEs were created in mid-1995 as Internet exchange points when the National Science Foundation retired its NSFnet Internet backbone. Concern about packet loss

See Peer, page 128

Explosion of spam leads to pesky new scam

By Chris Nerney

Dear Friend,
You are about to make \$50,000 — in less than 90 days. Read the enclosed program. Then READ IT AGAIN!...

If that frenetic pitch sounds familiar, you are among the thousands of E-mail users who have been spammed in the past few months by Christopher Erickson.

And it is only going to get worse. Multilevel marketers, pyr-

See Spam, page 16

It's three modems in one

By Tim Greene

Santa Clara, Calif.

You thought you had heard about all the solutions to fast Web access: 56K bit/sec modems, ISDN, frame relay, digital subscriber line and cable modems.

Here is a new one: Tie three modems together for 156K bit/sec Web page downloads.

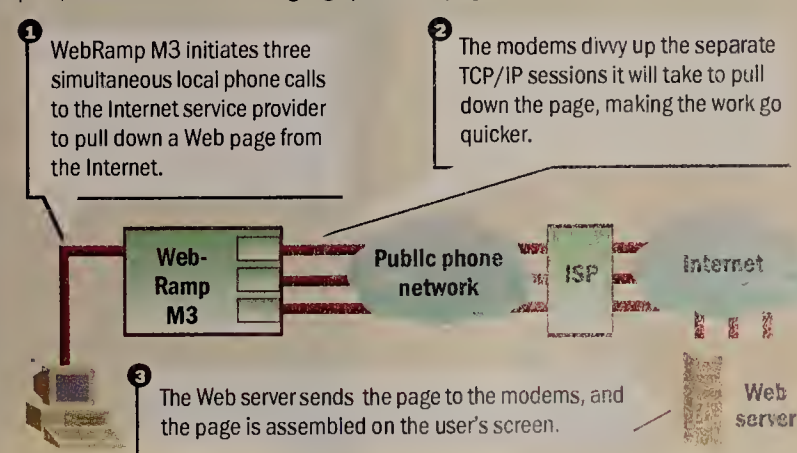
That is what Ramp Networks is offering with WebRamp M3, the company's modem pool/IP router/Ethernet bridge, scheduled to be announced next week.

The company says customers can get more bandwidth than ISDN provides with fewer provisioning hassles.

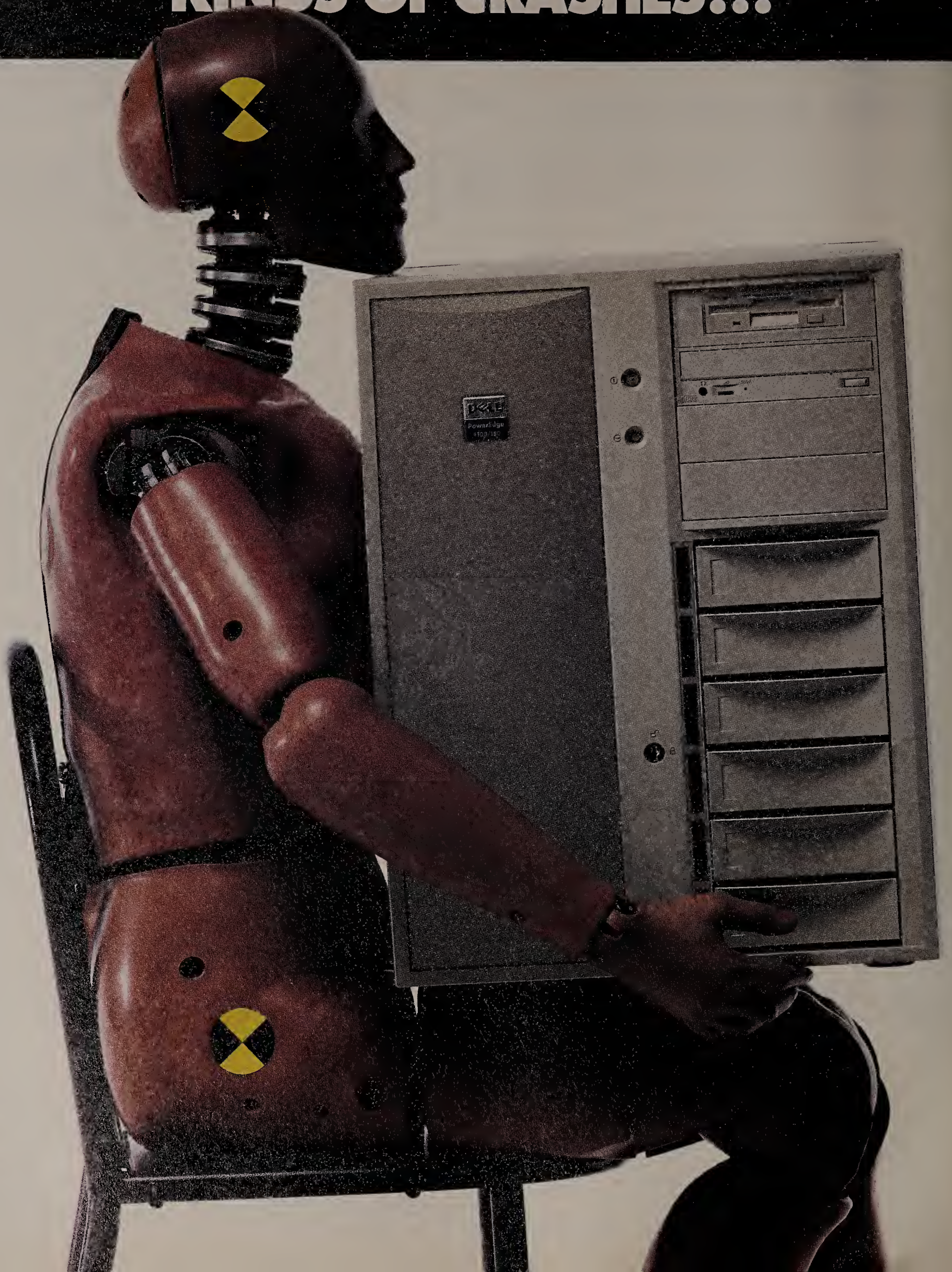
While Ramp was not forthcoming, See Ramp Networks, page 124

MODEM TRIPLE PLAY

Ramp Networks' WebRamp M3, a combination Ethernet hub IP, router and modem pool, uses three modems to gang up on Web pages.



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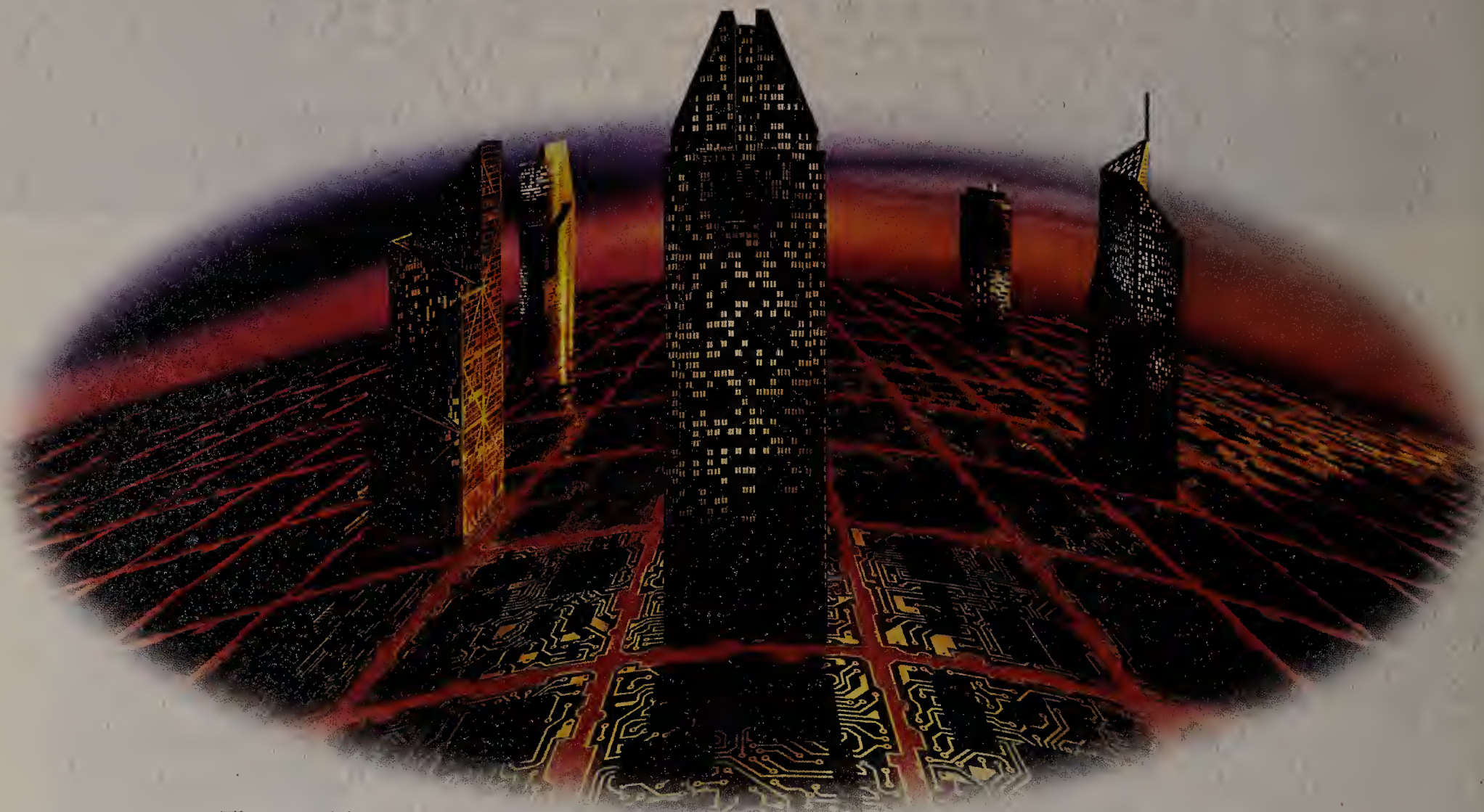
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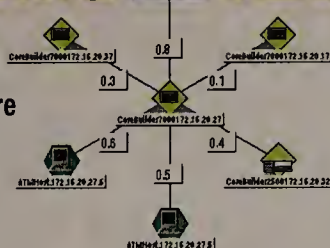
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AT&T'S 'NET CHIEF SPEAKS OUT

Tom Evslin explains the carrier's plans to change the Internet world. Page 57.

VALIDATING VLANS

New 3Com management software lets users get more out of virtual LANs. Page 42.



MCI MAKES EDI BID

The carrier grabs a partner to help get customers' electronic commerce efforts on track, says MCI official Martha Hanlon. Page 12.

FIND IT ON FUSION

To quickly get to any online info referenced in *Network World*, enter its DocFinder number in the input box on the home page.



This Week

Only on Fusion

- **N+I.** Link to Fusion this week for exclusive coverage of NetWorld+Interop 97. We will feature breaking news, background articles and our daily calendar of sessions you should not miss. On Wednesday, we will have a live audio and video broadcast of our celebrity NetBowl trivia challenge. Coverage begins at 9:30 p.m. EDT, 6:30 p.m. PDT. **DocFinder: 1609**
- **Carrier services.** AT&T last week raised its rates for inbound 800 and 888 service. **DocFinder: 1828**
- **Internet.** Sprint and UUNET last week told several smaller ISPs they will stop exchanging data with them for free. **DocFinder: 1830**
- **The industry.** A judge last week lifted the last of the restrictions on IBM from a landmark 1956 antitrust decision. The ruling affects how IBM can sell its AS/400 and S/390 systems over the next few years. **DocFinder: 1829**
- **From the front page**
- **Spam.** Read our page 1 story about spam scams, then go online for tips on how to beat back the spam tide. **DocFinder: 1827**
- **Internet.** Read up on ISP peering online with an overview of the Border Gateway Protocol, a look at ways that ISPs can hand off charges for exchanging data and listings of North American exchange points. **DocFinder: 1824**

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REVIEW: HP and LANart top field of five port switch hubs. Page 79.

CRAFTING AN AUP:

The Chinese menu approach. Page 85.



News briefs, May 5, 1997

News from Novell

Novell, Inc. next week at NetWorld+Interop 97 is expected to announce an agreement with Microsystems Software, Inc. under which Microsystems' Cyber Patrol content filtering technology will be built into Novell's upcoming Border Services product.

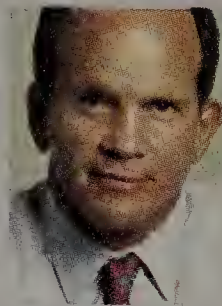
Announced at BrainShare last month, Border Services is a combination firewall and proxy server that sits at the edge of an IntranetWare network and provides secure access to Internet resources.

Novell also will unveil its strategy for giving IntranetWare users access to host-based information via the Web. Central to this strategy will be a technology code-named Meta Connect 3270, which converts 3270 datastreams into HTML format so the information can be viewed by any browser (NW, April 7, page 1).

Will Bay buy into Gigabit Ethernet?

Rumors were swirling last week that Bay Networks, Inc. had signed a letter of intent to buy Gigabit Ethernet start-up Rapid City Communications. The unconfirmed deal would give Bay some hot new products, including a family of Gigabit Ethernet devices that can switch and route on any port at wire speed. But Joe Kennedy, president and CEO of Rapid City, said there is no such agreement with Bay.

"We have had discussions with Bay and probably half a dozen other companies about acquisitions and OEM deals, and I can tell you that [the Bay] rumor is a vicious lie."



Rapid City's
Kennedy

You're on the hook for pay phones

AT&T last week increased prices for its inbound 800- and 888-number services by 7%. The increase comes on top of a 3% increase in inbound service prices announced last February. AT&T blamed both the February rate hike and last week's action on a new federal regulation requiring carriers to compensate pay phone owners for 800 and 888 calls originating at their phones. But the 7% rate hike applies to all inbound calls, including those from regular home and business phones made to call centers. At the same time, AT&T also boosted rates 2% on outbound business services such as Software Defined Network and Switched Digital Services.

Cisco revving up new router

Cisco Systems, Inc. this week is expected to detail the components of its Gigabit Switch Router (GSR) project and announce the 3800 access multiplexer (NW, April 7, page 1) at NetWorld+Interop 97.

GSR is expected to include three models with bandwidth scalable to 80G bit/sec (NW, March 31, page 1).

Revisiting the Tandem-Microsoft alliance

Tandem Computers, Inc. and Microsoft Corp. penned a deal to cooperate on Windows NT-based clustered systems one year ago. Tandem next week will demonstrate the progress it has made on the technology in a half-day presentation in San Francisco led by Tandem CEO Roel Pieper.

The demonstration is expected to focus on an affordable fault-tolerant server cluster that uses Tandem's ServerNet technology as the physical connection among nodes and runs Microsoft's Wolfpack clustering software. These servers will also be running Tandem's cluster management software and ServerWare middleware.

Network Peripherals buys NetVision

LAN switch vendor Network Peripherals, Inc. last week announced that it will acquire NetVision, Inc., a privately held Application Specific Integrated Circuit company based on Long Island, N.Y., for \$6 million. NetVision's low-cost IP switching and Gigabit Ethernet chips will form the foundation of Network Peripheral's new line of stackable switches.

Microsoft wares ease Web site mgmt., add commerce hooks

By Carol Sliwa
Orlando, Fla.

Microsoft Corp. last week announced a software product called Site Server 2.0 that is designed to give users everything they need to enhance, deploy and manage their Web sites.

The bundle repackages a number of existing Microsoft and Microsoft-acquired products. A new Site Server Enterprise Edition tacks on a few new commerce-related pieces.

The Enterprise Edition features an updated version of Microsoft Merchant Server (now called Commerce Server) to sup-

port business-to-consumer and business-to-business transactions over the Internet, as well as a new client called Microsoft Wallet.

Microsoft Wallet is said to securely store name, address and credit card information so shoppers can more easily purchase items over the Internet, without having to type in identifying information every time they engage in a transaction.

Standard Site Server features include:

- Usage Analyst, for generating reports that show how a Web site is used.

Reports can include the amount of time surfers use a site, the most used pages and the ads explored. Usage Analyst was formerly known as Market Focus when sold by Intersé Corp., a company that Microsoft acquired earlier this year.

- Site Analyst, for building a database with all of the information about a Web site's content. The software can help users visualize the content by generating graphic reports. Site Analyst also

Upgrades push Windows NT further into the enterprise

By Christine Burns
Redmond, Wash.

Call it the Enterprise NT tour.

In its ongoing effort to prove that Windows NT is an enterprise-class operating system capable of handling core business applications, Microsoft Corp. is holding a series of events to unveil scalability and reliability enhancements, as well as new legacy systems links for NT.

Day on May 20 in New York.

The company's Wolfpack software clusters two NT servers and their subsystems into a single entity, with automatic fail-over should the operating system, hardware or any application crash on either system.

Wolfpack Beta 2 has failover support for multiple print queues and simplified processes for setting up applications for a clustered environment.

It adds support for the RAID technology built into NT for striping data among disk subsystems and lets servers maintain communication via a local net link should the dedicated high-speed interconnect between the servers snap.

Beta 2 was recently shipped to 750 users and developers. Wolfpack will be generally available this summer.

At Interop, Microsoft will demonstrate Cake-walk and Thor. Cake-walk is the code name

for a data replication tool that pushes data from IBM DB2 databases to SQL Server databases on NT. It is designed to help administrators shuttle data from more costly high-end machines to less expensive Wintel boxes in branch offices, said Kevin Kean, product manager for Microsoft enterprise products.

Thor, also a code name, gives
See Windows NT, page 8

MICROSOFT'S SHOW PLANS

Conference	Plan
TechEd user conference	Will demonstrate the latest developments with its Wolfpack clustering software.
NetWorld+Interop 97	Will show off Cakewalk, a data replication tool, and Thor, a tool that gives NT applications record-level access to files on VSAM systems and AS/400 machines.
Scalability Day	Will detail strategy for NT enterprise-class services, including support for 64-bit hardware in NT 5.0.

MICROSOFT'S NEW BUNDLES

Product	Price
► Site Server 2.0	\$1,499
► Site Server 2.0, Enterprise Edition	\$4,999*

* \$499 for each additional commerce site

This server software will be prereleased this month. The final version is due this summer.

can be used to check for a variety of problems, such as broken links and orphaned pages.

The product was formerly called WebMapper when sold by NetCarta Corp., a company that Microsoft acquired last year.

- A Personalization System (formerly part of the Microsoft Commercial Internet System, or MCIS), which helps users customize content to their tastes.

- Visual InterDev, an existing Microsoft development tool for building Web applications.

- Content Replication System (formerly part of MCIS), which allows users to reliably transfer content from a staging server to a production server.

- Web Publishing Wizard and Posting Acceptor (both of which have been included in other Microsoft products), which let a variety of Microsoft and non-Microsoft clients post content to a Web server.

The Enterprise Edition is a superset of the standard version, adding commerce pieces as well as a beefed-up Usage Analyst that can generate usage reports for multiple Web servers.

The server software strictly runs on Windows NT, with the exception of the usage and site analyst tools that run on multiple platforms. ■

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NETWORLD+INTEROP 97

Netscape's new directory beta supports LDAPv3

By Carol Sliwa
Las Vegas

Netscape Communications Corp. next week will launch a beta version of its new Directory Server that supports the latest draft of the Lightweight Directory Access Protocol (LDAP) standard.

But while support for LDAP Version 3 will vault Netscape ahead of competitors, analysts minimized the practical importance of the release. They said Version 3 still falls short of LDAP's promise to harmonize

disparate corporate directories.

"Netscape is riding the LDAP hype more than anyone, so the only way to maintain that hype is to keep things going out the door," said Jon Oltsik, a senior analyst at Cambridge, Mass.-based Forrester Research, Inc.

Netscape Senior Product Manager Frank Chen, however, defended the beta. He claimed customers want to start moving to the "right architecture," where applications no longer have to rely on their own native directories, but become LDAP

clients to a central directory server.

For instance, Federal Express Corp. (FedEx), a big Netscape customer, currently has a master LDAP directory containing personnel information and another directory for applications.

"Right now...there's no real business requirement to make [the directories] talk," said Don Fike, a senior technical fellow with FedEx. "But at some point in the future, there will be a strong requirement to have that happen."

That is when the intelligent referrals that are part of Netscape's Directory Server 3.0 will come into play and help FedEx integrate directories. Intelligent referrals also will enable FedEx to locate information about individuals housed in directories outside the company.

Intelligent referrals are just one of the features of the LDAPv3 specification that is being finalized. Others include:

- A dynamically extensible schema, or attributes, describing what is inside a directory that can be extended on the fly.

- Secure Sockets Layer 3.0 support.

- International character sets to facilitate directory access in different languages.

- Type-down addressing that lets a user scroll down to the desired part of the directory by typing a few letters of a name.

Netscape's new directory server also features client-initiated selective replication, whereby a client reads a log that chronicles changes to a master directory and then conforms itself to the master, Chen said. But, that is not part of the LDAPv3 draft.

In fact, the absence of replication procedures is one of the big

strikes against the LDAPv3 proposal, along with the lack of a schema registration plan for letting users search directories that employ common attributes.

Oltsik called the promise of LDAP a "pipe dream" at this point.

"The 80-20 rule applies. It'll get us 80% of the way there," Oltsik said. "LDAPv3 isn't really addressing any of the server-to-server [replication] stuff. That's the next round of negotiations in the v4/v5 time frame."

But Oltsik said Netscape is forcing the hands of major vendors. Microsoft Corp., Novell, Inc., and Lotus Development Corp. have pledged support for LDAP, but none are producing products at Netscape's pace.

"While what Netscape is doing is good, pushing the standards world, it doesn't necessarily mean their products win," said Bruce Robertson, a Texas-based program director with META Group, Inc. "This process is going to take a lot longer than Netscape would want anyone to believe. Netscape wants directories to be on Internet time. Tough. Directories are going to live and die on application time."

Netscape's Directory Server 3.0 goes into beta next week on Windows NT and Solaris. The final product is due in the third quarter and is priced at \$995. ■

Netscape plunks down \$56 million for two companies

Seeking to bolster its Web graphics tools and enterprise messaging offerings, Netscape Communications Corp. last week signed agreements to buy two companies, DigitalStyle Corp. and Portola Communications, Inc.

DigitalStyle offers expertise in Java-based graphics animation and component models, while Portola is a leading authority on the Internet Message Access Protocol 4 and Post Office Protocol 3. Portola's chief engineer, John Myers, and members of the company's development team will join Netscape, a spokeswoman said.

The agreement calls for Netscape to purchase 100% of the privately held companies' outstanding capital stock by issuing approximately 2.08 million shares of Netscape's stock. Given the closing value of Netscape stock on the day of the announcement, that would make the transaction worth approximately \$56 million.

In other news last week:

- Netscape announced that the U.S. Department of Commerce has approved the export of 56-bit encryption in Netscape software. The company is still working to get permission to export 128-bit encryption.

- To further its vision of crossware applications, Netscape announced it forged alliances with close to one dozen companies, including Oracle Corp. and Informix Software, Inc., to deliver Online Analytical Processing tools and data warehousing products to run in Netscape's environment. The companies all have pledged to support the technologies on which Netscape's Open Network Environment relies, such as HTML, Java, JavaScript, the Lightweight Directory Access Protocol, Common Object Request Broker Architecture and Netscape Server API.

— Carol Sliwa

NETWORLD+INTEROP 97

USR delivers on DSL promises

By Tim Greene
Las Vegas

U.S. Robotics (USR) today will announce the availability of its pioneering hybrid modems that support analog and digital subscriber line (DSL) connections.

The modems, discussed earlier by USR (NW, Feb. 17, page 1), will be available later this month and priced starting at less than \$250, industry sources said.

Among the first available products is Viper, an analog/DSL modem for the customer end with an integrated router for connecting to a LAN, priced at \$495. Also available is a \$775, two-port DSL card called Axccl that fits in the USR Total Control Enterprise Network Hub platform to terminate DSL connections at the service provider end.

Cobra, a PC card due in July costs \$200, USR said earlier.

Gear that will support DSL service for 30 lines costs about \$30,000 and is priced to encourage competitive local exchange carriers and Internet service providers to jump into the DSL market, sources said.

When they buy in bulk, carriers and ISPs could provision each customer line for less than \$500, sources said. That is the price ISPs say they need to hit to make it feasible to offer DSL services.

The new modems will be software upgradable, so users can buy them configured as USR's 56K bit/sec modems, known as x2, and add DSL features as they choose. DSL capabilities will come in several flavors, known collectively as DSL-light, that

range in speed from 128K bit/sec to 384K bit/sec, sources said.

Later, a rate adaptive DSL will be available at speeds as high as 7M bit/sec.

The initial USR hybrid modem offerings will be based on frame relay, but later upgrades will be based on ATM, the company said. USR said it expects to soon add the ability for a single modem to support multiple channels over one phone line.

The modems are the first of their kind and are supported by a new, super-fast digital signal processing (DSP) chip from Texas Instruments, Inc. (TI), industry sources said.

USR will announce today an alliance with TI to promote DSL standards. There are currently two competing DSL coding schemes, and work is underway to consolidate them.

The USR-TI alliance will also push use of the new TI DSP chips, with the goal of reducing price via high sales volume. ■

Windows NT

Continued from page 6

NT applications record-level access to files on VSAM systems and AS/400 machines. It presents legacy files to the application developer as objects that can easily be integrated into server applications.

Cakewalk and Thor work with Microsoft's SNA Server to provide connectivity to legacy systems. Pricing and delivery details are not yet available.

At its Scalability Day, the software giant will run NT 5.0 on eight- and 10-way symmetric multiprocessing machines in a demonstration with several hardware partners. Microsoft contends NT was built to run on up to 32 processors, but critics say users will not see much of a performance boost after four processors.

Microsoft will also detail plans for other enterprise-class services for NT, such as support for 64-bit hardware in NT 5.0. Supporting 64-bit hardware, such as Digital Equipment Corp.'s Alpha chip and the

upcoming Merced chip from Intel Corp., will allow NT to support applications that require access to large amounts of memory, although NT 5.0 will not be a full 64-bit operating system.

Microsoft's Enterprise NT message appears to be taking root with customers. "In the last six months, Microsoft has made the right moves to get NT into larger shops," said Rand Morimoto, president of systems integrator Inacom Information Systems, Inc. in Oakland, Calif. ■

CORRECTIONS

In our article on Netcom (April 7, 1997, page 19) company official Mike Kaliet was misquoted. The quote should have read, "Netcom will contact those users who consecutively have dial-up times over 100 to 200 hours each month to offer them a service that is better suited to their needs." We apologize for the error.

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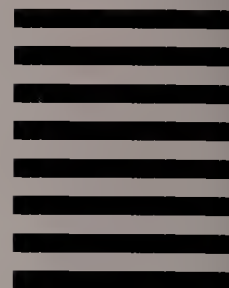
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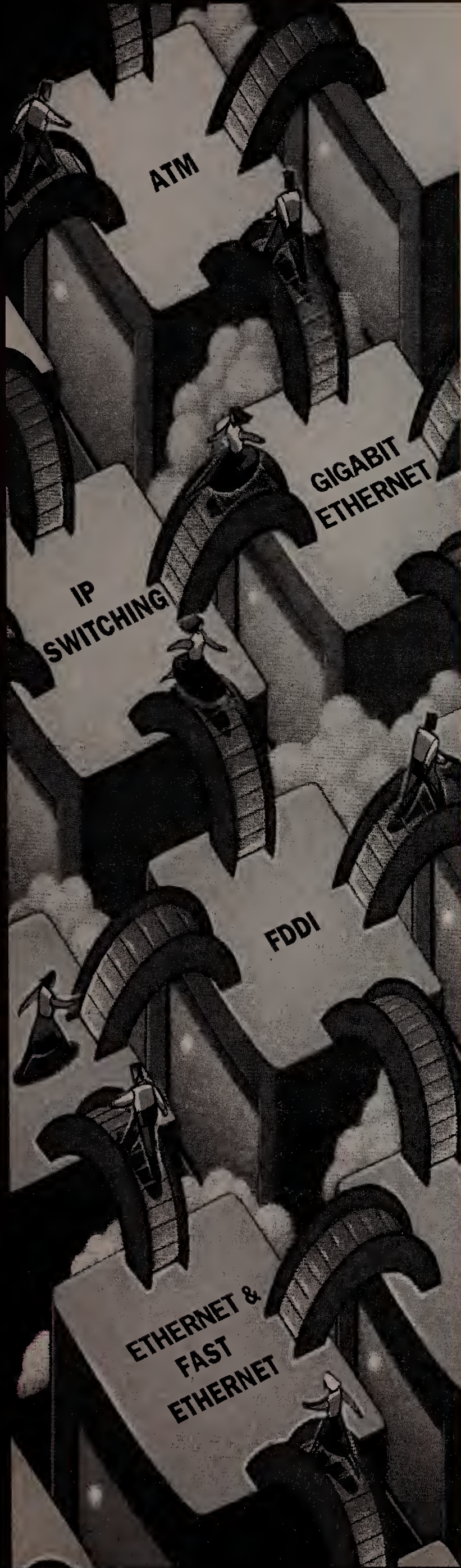
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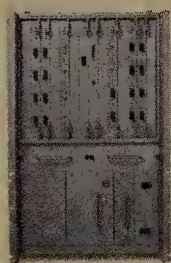


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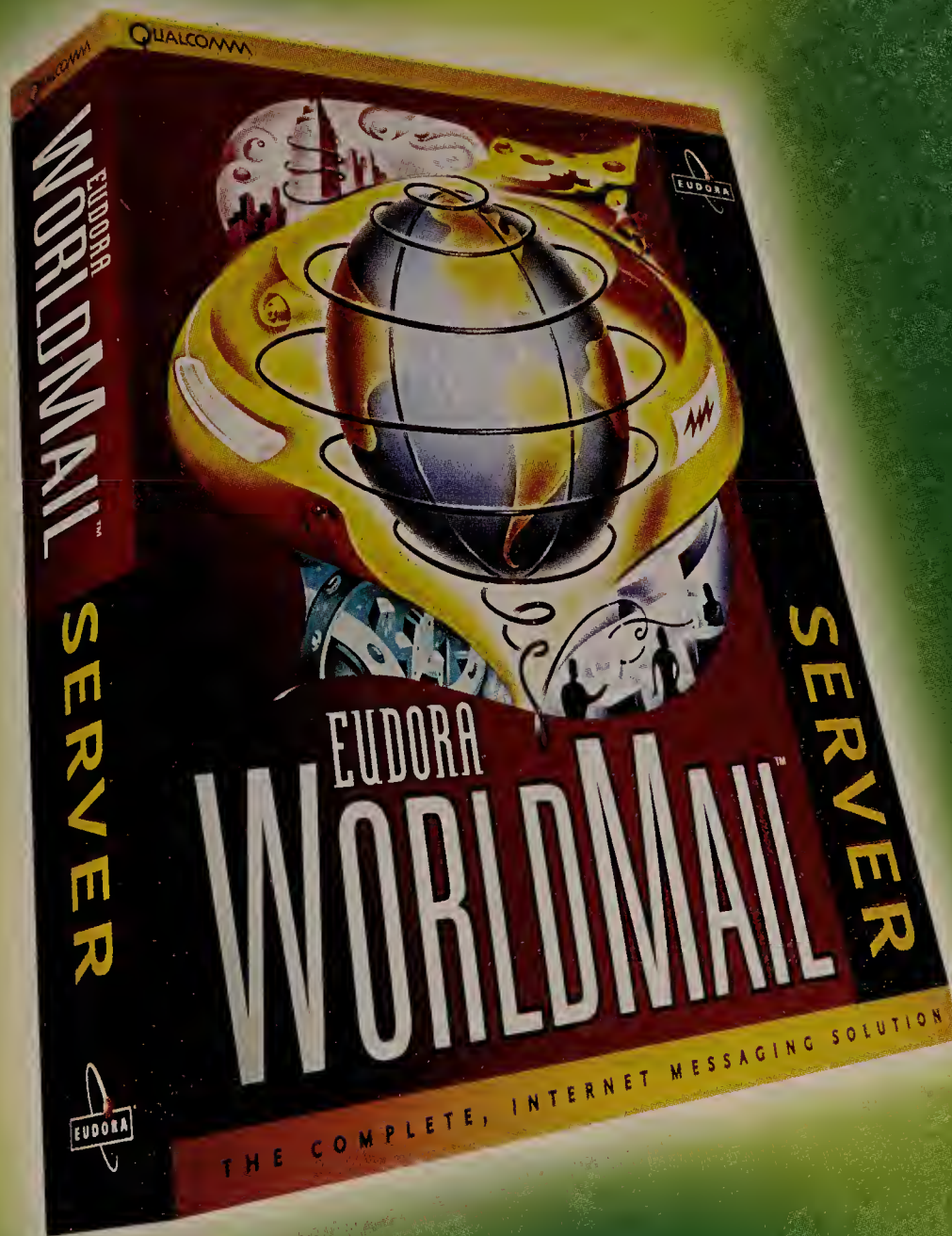
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Litwack bids Sybase adieu, joins 'Net start-up



One of client/server computing's pioneers wants to blaze a trail in cyberspace.

David Litwack, best known as the father of the PowerBuilder development tool, is about to join Internet start-up SilverStream Software, Inc. as president and CEO.

He says his job is done as a vice president at Sybase, Inc., the company that bought Powersoft Corp. two years ago.

The 50-year-old Litwack has been commuting between his native Boston and the California headquarters of Sybase, where his job was to create a coherent product strategy, an architecture to support it, and a management team to see it through.

Litwack spoke with *Network World* Senior Editor John Cox last week about the challenges that lay ahead.

What can you say about your new venture, SilverStream?

[The product line is] unannounced, so I'm not going into details. But it is a next-generation Web application platform. It will be a hybrid of several technologies: database access, rapid application development, imag-

ing and document processing. [Our technology will also be able] to work with both structured and unstructured data.

Does PowerBuilder have a future on the Web?

There's no reason you can't use PowerBuilder. In its next phase, now going into beta test, it will generate ActiveX [controls] and later, JavaBeans [reusable Java components]. The goal with Powersoft's product line is to provide a set of integrated tools that cover all the languages of the Web [C++, Java, PowerBuilder 4GL and JavaScript].

How is the Web changing client/server?

You have to distinguish between application development and deployment. In development, the change from mainframe to client/server [involved overcoming] several hurdles. Most databases used to be hierarchical or network, not relational. People had never seen a [graphical user interface] environment.

The GUI, in turn, sparked event-driven programming and object orientation. All that was new.

But look at Web application development today. It still involves [relational database management systems]. The Java GUI is still a GUI.

And Java, though not a [fourth-generation language], is still event-driven and object-oriented. What's different is that you deploy [new] applications as thin clients running in browsers.



The man behind PowerBuilder, David Litwack, has plenty to say about the emerging Web development tool market.

Can the browser be an effective client for this new class of applications?

The browser is just a container for information streaming from Web servers. The thing that is too limited is HTML. But add Java applets or ActiveX controls to a browser, then it is very possible to have a browser interface that matches or exceeds the [one] you expect from Windows clients today.

Isn't the shift from a two-tier application model consisting of a client and server to a three-tier

application model that also includes a Web server a big hurdle in moving from client/server to Web applications?

The Web forces [you to adopt] a multitiered environment. But I don't think it's a "two-tier vs. three-tier" issue. The issue is: What's the appropriate approach? If you use HTML on a Web site, it feels like you're going back 15 years to work on a dumb terminal.

So what's the solution?

How does the Web client become smarter? Today, you have three choices: Evolve HTML, use ActiveX or use Java.

We're in a very evolving situation in terms of what the solution will be.

PROFILE: SILVERSTREAM SOFTWARE, INC.

Based: Burlington, Mass.

Founded: June 1996

Primary product: Tool set for building and deploying business applications on the Web; will be announced in June

Management: David Skok, founder and chairman, previously founded Watermark Software

David Litwack, president and CEO; previously Powersoft's main architect and a vice president at Sybase

Several other former Watermark and Powersoft executives

What do you think it will be?

Evolving HTML, trying to make it an object-oriented development environment, is an unnatural act. ActiveX is a Microsoft initiative, and it's more mature than Java is now. But my belief is that the cleanest, best architecture for the industry is a complete Java solution. ■

Mega carriers tackle EDI

By Ellen Messmer
Baltimore

MCI Communications Corp. has a new partner for electronic data interchange. The carrier last week announced an alliance with The APL Group, Inc. under which the Wilton, Conn.-based EDI consulting and software firm will help MCI's customers get involved in electronic commerce efforts.

In fact, MCI will rely exclusively on APL to work with MCI customers, particularly small or midsize companies, according to Martha Hanlon, MCI director of enterprise applications and access.

The U.S. government's mandate that federal agencies and their 350,000 suppliers be EDI-capable by 1998 was a factor in MCI enlisting APL's aid to win new EDI customers. "Only 50,000 of [the suppliers] are EDI-capable now," Hanlon said.

However, the deal is not exclusive. APL can provide the same services to other value-

added network providers, said Norman Barber, managing director of APL.

How AT&T spells EDI

AT&T, also eyeing the potentially huge federal EDI market, last week announced a value-added network service called

"We want to help smaller customers that haven't yet stepped up to EDI."

Martha Hanlon, director of enterprise applications and access, MCI



BidAdvantage for vendors that compete to supply goods or services to the government.

Based on a profile submitted by the vendor, BidAdvantage sorts through thousands of government EDI-based requests for quotes (RFQ). The service can then provide the vendor with

corresponding RFQs on which it could bid.

BidAdvantage costs \$259 for the start-up service, which includes profiling and government registration, plus a \$119 monthly fee for receiving RFQs, transmitting bid responses and receiving electronic contract awards.

At this point, the Department of Defense is posting the majority of electronic RFQs, but civilian agencies are slowly increasing their EDI operations (see story, this page).

In fact, the General Service Administration's Web-based electronic catalog, which converts HTML into EDI, is slowly but steadily gaining momentum, said Teresa Sorenti, GSA director of acquisition operations for the federal supply services.

Last year, government buyers made only \$5.3 million in purchases at a rate of 200 orders per week through the GSA Advantage electronic catalog.

However, this March alone, buyers spent more than \$7 million, for a total of 2,000 orders per week. ■

NSA beefs up EDI security

By Ellen Messmer

The nation's top secret spy agency, the National Security Agency (NSA), is bringing battlefield encryption to today's woefully insecure electronic data interchange.

Last week, the NSA launched an EDI pilot project to purchase goods electronically from approximately seven vendors,

typically guides security communications policy for the entire military.

As a consequence, the vendors that do billions of dollars of business a year with the Department of Defense would have to use Fortezza-based EDI as well.

"This is our first initiative under the Defense Department mandate that all agencies do EDI by 1999," said Darlene Pencek, NSA's EDI program manager.

Get more info online:

- An overview of the Defense Department's EDI network
- Articles on electronic commerce security issues

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What to do

Next week, the federal agencies, and the network and software companies most closely involved in the government's electronic commerce efforts, will convene at the Logistics Management Institute in Tyson's Corner, Va., to debate which security scheme the government's IP-based electronic commerce model should follow.

"I feel certain NSA will put Fortezza on the table," said Lebbeus Curtis, chief of the customer support engineering division at the Defense Information Systems Agency, who will chair the meeting.

Curtis said he expects to hear the industry push for alternative encryption approaches, such as RSA Data Security, Inc.'s public-key infrastructure or even Pretty Good Privacy. ■

such as IBM and Xerox Corp., using the NSA's Fortezza PC Card.

The Fortezza card, which holds the user's X.509 public-key certificate, will be used by the NSA to digitally sign and encrypt transactions such as requests for quotes, responses, purchase orders, acknowledgments and invoices.

Fortezza is already being used in the Defense Message System to encrypt E-mail.

The U.S. Army, Navy and Air Force — which already purchase goods using unencrypted EDI — may also end up using Fortezza for EDI because the NSA, headquartered at Fort Meade, Md.,

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Actra readies EDI gateway for the Internet

By Ellen Messmer
Dublin, Ohio

Actra Business Systems LLC, the joint-venture company formed by Netscape Communications Corp. and GE Information Services, Inc. (GEIS), is getting ready for its big debut on May 19, but its first product, an electronic data interchange gateway for the Internet, may be delayed.

Sources at Actra last week said the ECXpert gateway, now in a controlled beta test with four corporations, is supposed to be ready by the May 19 event, but the product probably will not go out the door until the end of May at the earliest. Beta users are testing ECXpert to send EDI business messages over the Internet.

The ECXpert gateway is a collection of piece parts: a Netscape FastTrack Server, Netscape mail and directory servers, an EDI translation engine from TSI International, Ltd., a Seagate Technologies, Inc.'s Seagate Crystal reports generator and an Oracle Corp. Web application server with an Oracle7 database to record EDI audit trail and administrative data.



GEIS' Seegers says, "ECXpert will be open-standards-compliant and is designed as a clean gateway for Internet-centric computing."

Available on Windows NT or Unix platforms, ECXpert will accept business information from back-end systems, such as Server Advertisement

Protocol and convert that data into EDI format.

ECXpert packets EDI data as a Secured Multi-purpose Internet Mail Extensions (S/MIME) attachment. EDI data is automatically signed with the sender's X.509 digital signature certificate and encrypted using techniques defined by the Internet Engineering Task Force working group on EDI Interoperability.

The strength of the encryption to ship with ECXpert is still up in the air. It at least will be based on the 56-bit Digital Encryption Standard, rather than a far weaker 40-bit algorithm, because Netscape last week received export approval for 56-bit encryption. Netscape is pushing to receive the U.S. Department of Commerce's approval for 128-bit encryption as well.

Guy Fisher, the GEIS product marketing manager who organized Actra Business Systems, said GEIS is also looking at sending S/MIME over HTTP. ECXpert may ship with this more proprietary functionality as well.

Fisher said the plan is to have Netscape and GEIS as the "master distributors" of ECXpert, but the two joint-venture partners are also reviewing potential resellers.

At last week's Data Interchange Standards Association show, Harvey Seegers, GEIS president and CEO, gave a keynote speech in which he said the Internet will

revitalize EDI, which has not yet caught on with many smaller companies.

As to exactly how GEIS will thrive on the 'Net, where it cannot charge by the packet, Fisher said GEIS plans to operate

X.509 certificate management services to help closely defined trading partner communities get organized with digital certificates and get online.

Today, GEIS does not charge large cus-

tomers for help in getting smaller trading partners up and running with EDI on the GEIS EDI value-added network. The cost is recouped in the metered EDI value-added network service.

But on the Internet, GEIS will probably charge for the services it presently provides free as "community management," Fisher added. ■

ECXPERT
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AUDITS

Lotus to step up service and support efforts

By Paul McNamara

Having been read the riot act in January by its corporate parent IBM, Lotus Development Corp. last week laid out a plan to fix a customer support system that the software maker acknowledges has

long been in need of mending.

The blueprint is the first step toward delivering on a pledge to improve customer service made by IBM CEO Louis Gerstner. The pledge was made earlier this year at Lotus' annual conference for

customers of Notes, Domino, cc:Mail and other products. Analysts and users said the initiative is welcome and long overdue.

Here's what the Lotus plan entails:

- Adding approximately 300 employees to augment a service and support staff of approximately 1,000.
- Forming an emergency response

team of software developers who can address issues at a customer site in the event of a business-crippling breakdown.

● Building a \$3 million "competency center" staffed by 19 engineers, computer scientists and support analysts, and at which configuration and code change support will be available.

Lotus also said it will make better use of IBM's support expertise and work to integrate its own sales and support staffs into IBM's structure.

One Lotus customer reacted to the company's plan with cautious optimism and a plea for putting quality ahead of speed.

"We must fix Lotus' service and support problem."

Louis Gerstner, IBM chairman, at the Lotusphere '97 customer conference in January



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"I would rather wait a half hour and get a very good, professional, knowledgeable person than wait 10 minutes and get someone who doesn't know much or is trying to talk his way out of things," said Charlton Monsanto, technology director at Drexel University in Philadelphia.

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VDSL

Continued from page 10

For example, HarvardNet, a Boston-area ISP, is looking into VDSL as a way to connect a local advertising agency with a business associate so they can share motion picture quality video.

The agency would connect over copper wire to the HarvardNet DS-3 local backbone. The agency's traffic would then be dropped on to copper wire connecting to the customer at the other end, said Bill Southworth, president of HarvardNet.

The problem for HarvardNet is finding gear to support the service. Most DSL vendors are filling the demands of mainstream U.S. carriers, which so far want low-bandwidth DSL options.

One of the pragmatic DSL vendors is Pulse Communications, Inc. (Pulsecom), which last week introduced a convenient way for traditional telephone carriers to support all-data 128K bit/sec DSL.

Pulsecom's WavePacer ISDN DSL 128 Line Card drops into standard D4 channel banks — devices common to nearly every telephone carrier's network. At 128K bit/sec, the WavePacer falls within the bandwidth with which customers are familiar and is equal to that of the two B channels of a basic rate ISDN service.

The Pulsecom gear would turn traffic into frame relay frames and multiplex as many as 96 lines coming into a D4 channel bank onto a single T-1.

© Dagaz: (908) 595-2000; Pulsecom: (703) 471-2900

Spam

Continued from page 1

amid scheme operators and chain letter artists are quickly learning the power of bulk E-mail spamming.

The Erickson letter is the most widespread recent example. It invites recipients to take part in what Erickson calls an E-mail multilevel marketing (MLM) program that promises to make you wealthy.

But to many of the message's recipients, as well as hard-core opponents of online spamming, the offer is nothing less than a bid to commit postal fraud by asking people to send \$20 for four "reports" that claim to show people how to make millions through — you guessed it — mass E-mailings.

Even worse, the letter urges all recipients to repeat the process and send bulk E-mail by the thousands soliciting money for the reports. It offers to help by providing E-mail lists.

This mass-contact strategy is the bedrock of the legal, though exceedingly annoying, multilevel marketing business, as well as its outlawed cousins, the pyramid scheme and the chain letter.

The Erickson letter — which is so prevalent it is known to anti-spammers as "the

reports pyramid scam" — is indicative of what Sanford Wallace called an "exponential" increase in E-mail spams for money-making schemes.

Wallace should know. He runs Philadelphia-based Cyber Promotions, Inc., the Internet's best-known — and most-vilified — junk E-mail service.

While neither E-mail spamming nor get-rich-quick schemes are new, the Erickson letter represents the logical marriage of the two genres, according to Wallace.

"E-mail spam is such a perfect medium for MLM companies," Wallace said. "MLM companies are interested in getting their message out to many, many people."

Wallace said he is not familiar with the Erickson letter, even though some copies include a legal disclaimer from Cyber Promotions. That is because E-mail users who are not Cyber Promotions customers can easily relay their messages through the service's Simple Mail Transfer Protocol server to hide their identities.

"We're going to put a stop to that," Wallace said. "This week we're working on a fix to only allow our customers to

relay." Some of the people who have received Erickson's posts have forwarded copies to the Federal Trade Commission (FTC), the U.S. Postal Service and the Internal Revenue Service.

The FTC has been trying to rid cyberspace of scam operators. On April 24, the federal agency coordinated a "surf day" to uncover Web sites proffering bogus business opportunities. And last December, the FTC notified owners of more than 500 Web sites that they may have been promoting illegal pyramid schemes. FTC officials declined to comment on complaints about the Erickson letter or investigations into pyramid schemes being distributed via E-mail spam.

Rolf Schmidt is less reticent about get-rich-quick E-mail spams. Schmidt runs a Maryland-based Web site — the MMF (Make Money Fast) Hall of Humiliation — devoted to exposing and publicly shaming users who clog the 'Net with MLM, pyramid and chain letter spams.

Schmidt said the type of multilevel marketing letter bearing Erickson's name

is "years old, but since the Christopher Erickson version encourages suckers to spread it via bulk E-mail, it has been particularly virulent. I get at least one a week."

Schmidt said that although he has exposed people who have spread earlier versions of the letter, "I haven't successfully tracked down the original Christopher Erickson, if he indeed exists."

Schmidt has, however, nailed three online users who dutifully spammed E-mail per the letter's request. And who were the perpetrators?

"All of them are teen-age boys," Schmidt said. This may explain why Schmidt bills his Hall of Humiliation as "the bane of 14-year-olds everywhere."

Meanwhile, Wallace offered some words of hope for online users enraged by the rise of get-rich-quick spams.

Eventually it will hit a point where the amount of headache and complaints will override the profit potential, and then [this kind of spam] will die," he said. ■

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Circle Reader Service #16

Getting a grip on the frame relay market

Survey results to be presented at NetWorld+Interop.

By Tim Greene

If you think frame relay switched virtual circuits (SVC) are in your future, you are right. But they could be far in your future.

CUSTOMER MANAGEMENT
12 of 20 carriers polled already offer customer network management. Seven others are thinking about it.

Based on a survey of 20 frame relay carriers to be released through the Frame Relay Forum this week at NetWorld+Interop in Las Vegas, none of the carriers are providing SVC services yet.

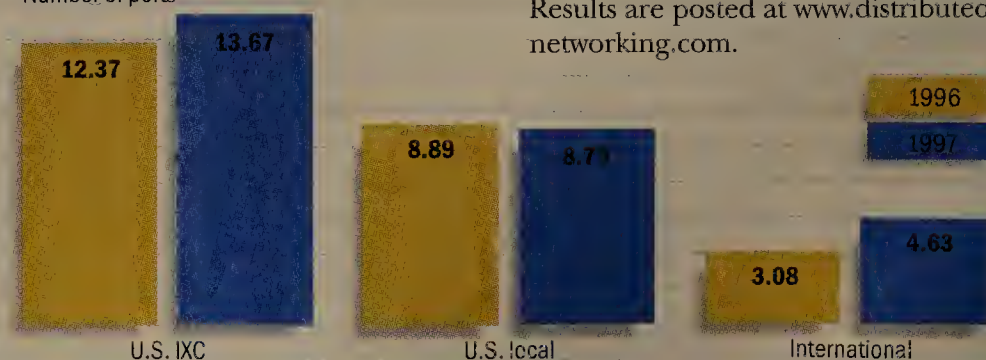
All say they will, some as soon as this summer.

But don't hold your breath, says Steve Taylor, president of Distributed Networking, Inc., a consultancy in Greensboro, N.C. Carriers have been

HOW MANY?

Comparison of frame relay ports per customer by type of carrier

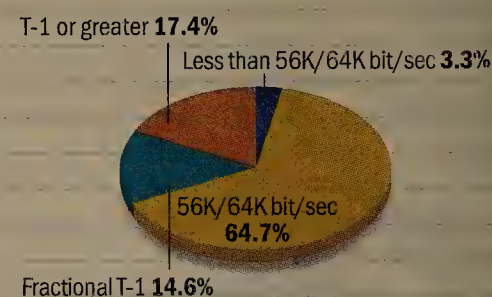
Number of ports



SOURCE: DISTRIBUTED NETWORKING, INC., GREENSBORO, N.C.

HOW FAST?

U.S. frame relay port speeds



Fractional T-1 14.6%
promising the same thing for the past three years that he has done the annual survey.

The survey, sponsored by the Frame Relay Forum and more than a dozen frame relay hardware vendors, also shows booming growth in frame relay service usage. Among 16 respondents, the total number of ports in service grew 97.9% between the start of 1996 and 1997. In addition, the survey measured port speed popularity, ports per customer and more (see graphics).

Taylor will discuss the survey results at the show on Tuesday at 10 a.m. at the Las Vegas Convention Center. Results are posted at www.distributed-networking.com.

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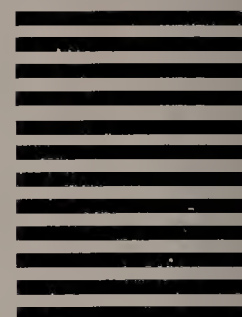
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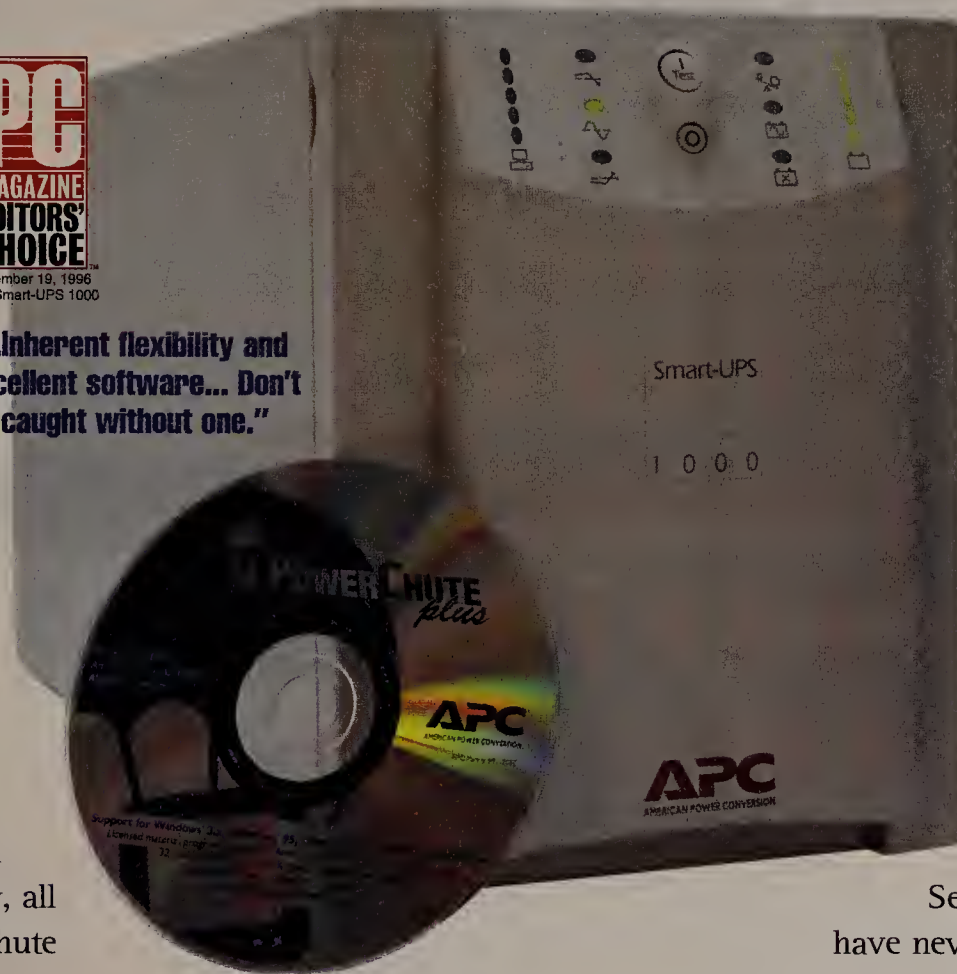
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WANs & Internetworking

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Briefs

■ **Versanet, Inc.** will announce this week at NetWorld+Interop 97 the ISP Accelerator, a **remote access server** loaded with as many as 48 56K bit/sec modems. The server has a 10M bit/sec or 100M bit/sec LAN port and two high-speed WAN interfaces with an optional DSU/CSU that supports frame relay. A fully loaded ISP Accelerator costs \$18,860.
© Versanet: (909) 860-7968

■ **FastComm Communications Corp.** last week introduced WEB.router Internet access devices that support T-1 frame relay wide-area connections. The devices come with high-speed serial interfaces that support **PPP traffic** or can be configured with 10M bit/sec Ethernet or token-ring ports. The WEB.router T-1/E-1 model list price is \$995. The Ethernet option is priced at additional \$200, while the token-ring option costs an additional \$300.
© FastComm: (703) 318-7750

■ **Larscom, Inc.** last week introduced T3Clear, a 45M bit/sec module for its Orion 4000 Broadband Access Multiplexer. T3Clear allows **multiplexing ATM, time-division multiplexer and voice and data traffic** on to a single point-to-point connection. T3Clear is available next week and costs \$6,950.
© Larscom: (408) 988-6600

■ **NetScout Systems, Inc.** has unveiled a **diagnostic probe for T-3 networks**. The NetScout T-3 WAN EnterpriseProbe monitors T-3 links through the application layer. When used with the company's NetScout Manager Plus console, the probe also provides long-term trend analysis and billing reports.

The NetScout T-3 WAN probe will be available in June for \$18,995.

NetScout later this year will roll out an ATM probe as well as products to monitor multimedia traffic and application response time.

© NetScout: (508) 244-4000

Vendors to reveal mgmt. wares at Interop

Micromuse, Competitive Automation and Desktalk address event and device control.

By Jim Duffy
Las Vegas

Three network management vendors this week will attempt to stand out from the NetWorld+Interop 97 crowd with enhancements to their event, address and SNMP device management wares.

Micromuse, Inc. will link Java and event management with Java EventList (JEL), software targeted at enterprise networks with 1,000 to 100,000 nodes. JEL was designed to allow users to track service levels in enterprise and service provider networks from a Web browser.

JEL works with Micromuse's Netcool/OMNIBus event management tool. It includes a Java applet that presents real-time Netcool/OMNIBus events and alarms on Microsoft Corp. and Netscape Communications Corp. Web browsers.

JEL is intended to provide a consistent Netcool/OMNIBus interface across all managed domains, regardless of the vendor management system used.

The JEL applet allows views to be distributed according to site,

geography and other parameters.

This will foster a tighter link between a company's IT operations center and its lines of business, said Theo Forbath, a consultant at Northeast Consulting Resources, Inc. in Boston.

Yet the Java aspect of JEL has its shortcomings. "You talk to people doing development in Java and they tell you it's like working in the Assembly language 10 years ago," Forbath said. "It doesn't have all of the mature tools that developers are used to [in C and C++]. Today, your debugger for C++ checks

NETWORLD+INTEROP 97

Lucent throws PC users into multimedia collaboration scheme

By David Rohde
Murray Hill, N.J.

Shooting for market acceptance, Lucent Technologies, Inc. this summer will aim to drive the cost of its wide-area multimedia collaboration system below \$1,000 per seat.

The lower price will come this July in the form of a new PC client for Lucent's Unix-based Multimedia Communications Exchange (MMCX) server. The offering will allow Windows 95 and NT client endpoints, on LANs outfitted with an MMCX server, to participate in multimedia sessions. These sessions will combine voice, video and data collaboration.

Until now, both the server and all the client endpoints had to be Hewlett-Packard Co. or Sun Microsystems, Inc. workstations running Unix.

This severely limited the MMCX's potential market and helped to drive implementation costs to around \$2,000 per seat or more.

The MMCX sits between a PBX with an Ethernet interface, such as Lucent's own Definity G3 voice switch, and an Ethernet or

ATM switch. It translates telephony call commands such as conference, hold or transfer for delivery over the LAN.

This way, several users can simultaneously manipulate a document and maintain an optional video link.

At the same time, other users can participate in voice-only mode, with users dropping on and off in a manner similar to the way they would during a conference call.

Lucent originally announced a timetable for delivering PC client support when the MMCX was unveiled in November 1995. But the company missed its original fall 1996 delivery date and has pushed back the target date

See Lucent, page 22

Is less than a grand low enough?

On a 100-seat installation, the upcoming PC client version of the Lucent Multimedia Communications Exchange server will reduce the overall cost to just under \$1,000 per seat.

Client version	Price for server hardware and software	Server right-to-use fee	License fee per client	Client software cost for 100 seats	Total installation cost	Total cost per seat
Unix client version (HP or Sun workstation)	\$47,210*	\$18,500	\$1,195	\$119,500	\$185,210	\$1,852
PC client version (Windows NT or 95)	\$47,210*	\$18,500	\$300**	\$30,000	\$95,710	\$957

* \$28,500 basic server price plus required additional Ethernet cards.

** Estimated; license fee not yet finalized.

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everything. You don't get that in Java."

JEL costs \$1,500 per client. It works with Netcool/OMNIBus 3.2, a new version of the event manager Micromuse will release this week.

In addition to JEL and other enhancements, Netcool/OMNIBus 3.2 features bidirectional server-to-server communications, distributed agent operation and continuous uptime in the event of server failure.

Netcool/OMNIBus 3.2 costs \$25,000 per server and \$7,500 per client.

Staying competitive

Competitive Automation, Inc. will make address management more dynamic with Join 4.0, a new version of the company's Dynamic Host Configuration Protocol (DHCP) server. Join 4.0 dynamically links DHCP-assigned addresses to Domain Naming System (DNS) names, eliminating a cumbersome manual task.

Manual configuration of each node in a TCP/IP network takes an average of 30 minutes per machine, Competitive Automation claimed. That means with a network of 3,000 machines, the process would require 1,500 hours.

The situation becomes more complex at large sites where each machine on average is disconnected, moved and reconnected three times a year, the company said. This amounts to 4,500 hours spent on TCP/IP configuration per year. And at about \$40 an hour for an engineer's time, a company could spend \$180,000 per year on the task. By automating the process with Join 4.0, Competitive Automation claimed companies can save that cost.

In addition to dynamic DNS updating, Join includes second-

See Interop, page 20

Boole & Babbage takes tools to the MAXM

By Jim Duffy
San Jose, Calif.

Boole & Babbage, Inc. this week will give users a progress report on its acquisition of MAXM Systems Corp. by rolling out products that meld Boole's manage-

ment tools with MAXM offerings.

Boole acquired enterprise management rival MAXM late last year to increase market share and expand its distribution channels (NW, Dec. 16, 1996, page 15). Boole's new products are intended to

appease skittish MAXM users looking for investment protection.

The products include management agents for MAXM's MAX/Enterprise system, which enables users to manage servers, middleware, applications and databases. The new products also include a version of Boole's PhonePoint call escalation software for MAX/Enterprise as well as a Windows NT client providing a single interface into MAX/Enterprise and Boole's Command/Post management systems.

Called Command Agents, the agents keep tabs on server performance and initiate corrective action when trouble occurs. The agents monitor Unix, NT, OS/2, AS/400, MVS and NetWare servers; IBM's MQSeries middleware; and BMC Software, Inc.'s Patrol application and database management software.

If the agents cannot remedy the situation, alerts are forwarded by PhonePoint to a mid-level manager or MAX/Enterprise console. PhonePoint can automatically dial out event notifications to on-call technicians, who can initiate remedial action via the telephone's touch-tone keypad. In addition to phoning event information, PhonePoint can also notify technicians via pager, fax and E-mail.

Events from MAX/Enterprise and Command/Post will be viewed with a Windows NT client Boole is developing. The NT client will support Microsoft Corp.'s ActiveX technology and a Web browser and will integrate the MAXM and Boole management environments.

Boole is also working on completing development of MAX/Enterprise 3.3.4 and Version 4.1, which will feature server-to-server communications.

Pricing starts at \$5,500 for Command Agents and \$40,000 for PhonePoint. Both are available now. The NT client will ship in June; pricing was not disclosed.

© Boole & Babbage: (408) 526-3000

Shomiti tunes line for intranets

By Jim Duffy
Las Vegas

Shomiti Systems, Inc., a maker of probes for high-speed LANs, this week will broaden its product line to address monitoring and analysis of distributed LANs.

At NetWorld+Interop 97 here, Shomiti will roll out Encompass, a product line that comprises probes, analyzers and applications for managing 10M/100M bit/sec Ethernet and 4M/16M bit/sec token-ring LANs.

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Components of Shomiti's Encompass

Product	Price	Availability
▶ Century Media Module 1	\$4,495	Now
▶ Century Media Module 2	\$7,495	June
▶ Century Tap	\$395	Now
▶ Century 12-Tap	\$3,995	Now
▶ Explorer	\$9,995	June
▶ Surveyor	\$995	June
▶ Voyager	TBA	Q3/Q4

Encompass' new components are Surveyor, Explorer and Voyager. Encompass also includes Shomiti's existing Century monitoring and adapter hardware.

Surveyor is software that provides protocol analysis and a Remote Monitoring 2 (RMON2)-compatible probe for Windows 95 and NT 4.0 systems. It views locally attached LANs and all other Encompass products on local and remote LANs. Surveyor runs over Network Driver Interface Specification-compliant Ethernet and token-ring adapters, and Shomiti's Century Media Modules (CMM).

Explorer is a 10M/100M bit/sec Ethernet analyzer the size of a laptop. It can be used as a portable troubleshooting tool or rack-mounted for real-time analysis and RMON2-based net monitoring.

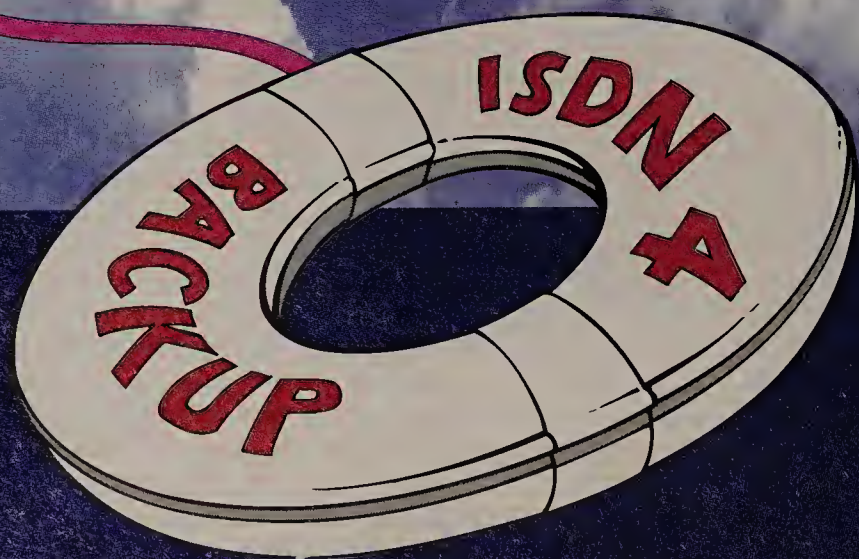
RMON2 ushers Shomiti into the realm of standards-based management. As a result, "now a lot of their customers can take advantage of other good analysis tools out there," said John McConnell, president of McConnell Consulting, Inc.

Voyager is a line of multiport 10M/100M bit/sec Ethernet RMON2 probes for monitoring multiple Ethernet segments. Voyager is a low-cost, multisegment probe priced at one-third the cost of other RMON2 monitors, Shomiti said.

Shomiti will also announce a new version of its CMMs as part of the Encompass rollout. CMM Version 2 are PC adapters that provide real-time monitoring of 10M/100M bit/sec Ethernet networks. As many as 16 Version 2 CMMs can run simultaneously in a PC, transforming that PC into a multisegment LAN monitor.

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Interop

Continued from page 19

ary IP addressing for support of multiple logical subnets on a single physical segment, improved variable-length subnet mask support and security customization enhancements.

Join 4.0 costs \$1,500 per server for up to 600 IP addresses. It is available now.

On the Desktalk

Desktalk Systems, Inc. will attempt to add simplicity to SNMP device management with Trend 3.4, software designed to automate tasks and provide more detail about managed devices.

Trend 3.4 contains an AutoPilot feature that discovers the network, sets up data collection and creates reports with the press of a button. It also includes an intelligent discovery tool that allows users to find out what is in the network without having prior knowledge of its topology.

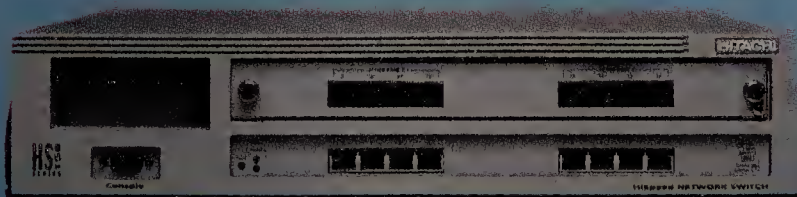
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Circle Reader Service # 7

Voice over ATM just got cheaper

By Tim Greene
Las Vegas

General DataComm, Inc. (GDC) this week will demonstrate at NetWorld+Interop 97 that it can mix voice traffic with data and video on its ATM switches. With this capability, customers can establish virtual private voice networks for an incremental cost of about a penny per minute,

GDC claimed.

ATM switches have been able to support voice traffic before but only by proprietary means (using special signaling) or by setting aside bandwidth that could then be used for nothing else.

GDC's APEX-Voice Service Module (VSM) is a card that fits into slots in GDC APEX switches. Each card has four T-1 slots. The basic card supports voice traffic over constant bit rate (CBR) service, essentially a dedicated channel across the ATM network.

The APEX-VSM is based on a pending International Telecommunication Union voice-over-ATM standard and can blend voice with other traffic on common trunks.

Users can avoid separate voice trunk costs among sites in private networks. It also uses the switch more efficiently because voice traffic no longer requires nailed-up circuits through the network.

The low incremental cost of dropping voice onto an ATM network is available only to users that have GDC-supported DS-3 ATM networks in place, according to Cathy Gadecki, a senior broadband consultant with TeleChoice, Inc., a consul-

tancy in Verona, N.J.

But when other ATM switch vendors get similar voice capabilities, incremental costs should be similar, Gadecki said.

The voice capability could be particularly useful across low-speed ATM trunks of 1.5M bit/sec where bandwidth is at a premium. Users would not want to pay for bandwidth that sits idle when there is no voice traffic, according to Steve Taylor, president of Distributed Networking Associates in Greensboro, N.C.

The card could also be used by carriers to reduce trunking costs by 30%, which could mean lower prices for customers.

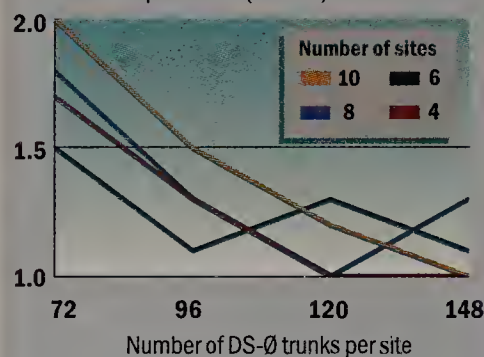
Daughtercards that support variable bit rate (VBR) voice can be added to the APEX-VSM. APEX-VSM will be available in the third quarter of this year. A four-port module capable of VBR voice with compression costs \$26,500. A four-port module that supports only CBR voice costs \$12,000.

© GDC: (203) 574-1118

VOICE NETWORK FOR PENNIES PER MINUTE

General DataComm predicts that variable bit rate ATM could send voice traffic over existing ATM networks for less money than a conventional virtual private network service.

ATM voice cost per minute (in cents)



SOURCE: TELECHOICE, VERONA, N.J.

Lucent

Continued from page 19

three times since then.

In its announcement, the company claimed it would deliver a "PC version" of the MMCX. This claim led to electronic news reports that the server itself would be migrated to a Wintel platform. But Lucent officials clarified that they were only delivering client-side support for PCs.

Costs are hefty for both the Unix and PC client versions. The base price for the server itself is \$28,500, but requirements for additional Ethernet cards to support 100 users bring up the cost to as much as \$47,210. There also is an additional fee for the right to use the server software, said

Joy Pinsky, Lucent's general manager of multimedia communication services. The potential price break occurs because the Unix client software license fee of \$1,195 per seat will be reduced dramatically for the Windows 95 and NT versions (see graphic, page 19).

With Windows 95 support, Lucent officials hope users that purchase IP-based data collaboration client software, such as Microsoft Corp.'s NetMeeting, will take a look at the MMCX.

Lucent has added support for the H.323 voice and data collaboration standard now emerging for Internet applications — the same standard Microsoft and others now follow for their multimedia Internet applications. ■

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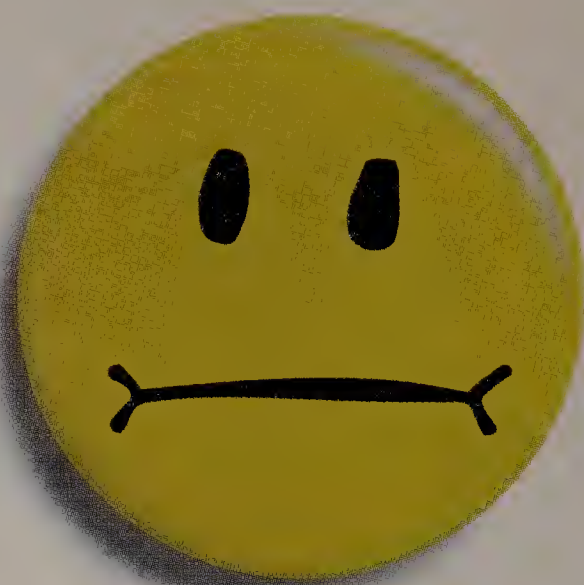
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Business FAX (_____) _____

Internet e-mail address _____

If there is a parent company, please provide name: _____

1 **Industry:** (check one only)

- | | |
|---|--|
| 01. <input type="checkbox"/> Manufacturers (other) | 12. <input type="checkbox"/> Government (Federal/State/Local) |
| 02. <input type="checkbox"/> Finance/Banking | 13. <input type="checkbox"/> Military |
| 03. <input type="checkbox"/> Insurance/Real Estate/Legal | 14. <input type="checkbox"/> Aerospace |
| 04. <input type="checkbox"/> Health Care Services | 15. <input type="checkbox"/> Consultants (Independent) |
| 05. <input type="checkbox"/> Hospitality/Entertainment/Recreation | 16. <input type="checkbox"/> Carriers/Interconnects |
| 06. <input type="checkbox"/> Media/TV/Cable/Radio/Print | 17. <input type="checkbox"/> Manufacturers (Computer/Communications) |
| 07. <input type="checkbox"/> Retail/Wholesale Trade/Business Services | 18. <input type="checkbox"/> Resellers of Computer/Network Products (VARs, VADs) |
| 08. <input type="checkbox"/> Transportation | 19. <input type="checkbox"/> Systems/Network Integrators |
| 09. <input type="checkbox"/> Utilities | 20. <input type="checkbox"/> Distributors (Computer/Communications) |
| 10. <input type="checkbox"/> Education | 21. <input type="checkbox"/> Other (please specify) _____ |
| 11. <input type="checkbox"/> Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry) | |

2 **What is your job function?** (check one only)

NETWORK IS MANAGEMENT:

- | | |
|---|---|
| 1. <input type="checkbox"/> Networking Management | 5. <input type="checkbox"/> Engineering Management |
| 2. <input type="checkbox"/> LAN Management | 6. <input type="checkbox"/> Corporate Management (CIO, CEO, Pres, VP, Dir., Mgr., Financial Management) |
| 3. <input type="checkbox"/> Datacom/Telecom Management | 7. <input type="checkbox"/> Consultant (Independent) |
| 4. <input type="checkbox"/> IS, IT, MIS, Systems Management | 8. <input type="checkbox"/> Other (please specify) _____ |

3 **What is the estimated value of networking equipment and services that you help specify, recommend or approve?** (check one only)

- | | | |
|--|--|--|
| 01. <input type="checkbox"/> \$100 million or more | 05. <input type="checkbox"/> \$10 mil. - \$19.9 mil. | 09. <input type="checkbox"/> \$250,000 - \$499,999 |
| 02. <input type="checkbox"/> \$50 mil. - \$99.9 mil. | 06. <input type="checkbox"/> \$5 mil. - \$9.9 mil. | 10. <input type="checkbox"/> \$100,000 - \$249,999 |
| 03. <input type="checkbox"/> \$25 mil. - \$49.9 mil. | 07. <input type="checkbox"/> \$1 mil. - \$4.9 mil. | 11. <input type="checkbox"/> None of the above |
| 04. <input type="checkbox"/> \$20 mil. - \$24.9 mil. | 08. <input type="checkbox"/> \$500,000 - \$999,999 | |

4 **What is the total number of sites for which you have purchase influence?** (check one only)

- | | | |
|-------------------------------------|-------------------------------------|----------------------------------|
| 1. <input type="checkbox"/> 100+ | 4. <input type="checkbox"/> 10 - 19 | 7. <input type="checkbox"/> None |
| 2. <input type="checkbox"/> 50 - 99 | 5. <input type="checkbox"/> 2 - 9 | |
| 3. <input type="checkbox"/> 20 - 49 | 6. <input type="checkbox"/> 1 | |

5 **Are you involved in the purchase of and/or plan to purchase network products and services?**

☐ Yes ☐ No

6 **Check ALL that apply in Columns A and B:**

A. I am involved in the purchase of the following products/services:

B. I plan to purchase the following products/services:

LOCAL-AREA NETWORKS

- | | |
|------------------------------|---|
| A | B |
| <input type="checkbox"/> 01. | <input type="checkbox"/> Local-Area Networks |
| <input type="checkbox"/> 02. | <input type="checkbox"/> Network Op. Sys. Software |
| <input type="checkbox"/> 03. | <input type="checkbox"/> LAN Storage/Backup |
| <input type="checkbox"/> 04. | <input type="checkbox"/> Optical LAN Storage/Backup |
| <input type="checkbox"/> 05. | <input type="checkbox"/> Disk LAN Storage/Backup |
| <input type="checkbox"/> 06. | <input type="checkbox"/> Tape LAN Storage/Backup |
| <input type="checkbox"/> 07. | <input type="checkbox"/> RAID LAN Storage/Backup |
| <input type="checkbox"/> 08. | <input type="checkbox"/> Network Test/Diagnostic Tools |
| <input type="checkbox"/> 09. | <input type="checkbox"/> Cables, Connectors, Baluns |
| <input type="checkbox"/> 10. | <input type="checkbox"/> UPS |
| <input type="checkbox"/> 11. | <input type="checkbox"/> Network Interface Cards |
| <input type="checkbox"/> 12. | <input type="checkbox"/> Peer-to-Peer LANs |
| <input type="checkbox"/> 13. | <input type="checkbox"/> SNMP Network Management |
| <input type="checkbox"/> 14. | <input type="checkbox"/> ATM Switches |
| <input type="checkbox"/> 15. | <input type="checkbox"/> Token-Ring Switches |
| <input type="checkbox"/> 16. | <input type="checkbox"/> Ethernet Switches |
| <input type="checkbox"/> 17. | <input type="checkbox"/> Remote LAN Access/Communications Servers |
| <input type="checkbox"/> 18. | <input type="checkbox"/> Superservers |
| <input type="checkbox"/> 19. | <input type="checkbox"/> File/Application Servers |
| <input type="checkbox"/> 20. | <input type="checkbox"/> Print Servers/Fax Servers |
| <input type="checkbox"/> 21. | <input type="checkbox"/> CD-ROM Servers |
| <input type="checkbox"/> 22. | <input type="checkbox"/> LAN Servers |

INTERNETWORKING

- | | |
|------------------------------|---|
| A | B |
| <input type="checkbox"/> 23. | <input type="checkbox"/> Bridges |
| <input type="checkbox"/> 24. | <input type="checkbox"/> Routers |
| <input type="checkbox"/> 25. | <input type="checkbox"/> Bridge/Router |
| <input type="checkbox"/> 26. | <input type="checkbox"/> Gateways |
| <input type="checkbox"/> 27. | <input type="checkbox"/> Intelligent Hubs |
| <input type="checkbox"/> 28. | <input type="checkbox"/> Stackable Hubs |

COMPUTERS/PERIPHERALS

- | | |
|------------------------------|--|
| A | B |
| <input type="checkbox"/> 29. | <input type="checkbox"/> Laptops/Notebooks/Sub-Notebooks |
| <input type="checkbox"/> 30. | <input type="checkbox"/> Micros/PCs |
| <input type="checkbox"/> 31. | <input type="checkbox"/> Minis |
| <input type="checkbox"/> 32. | <input type="checkbox"/> Mainframes |
| <input type="checkbox"/> 33. | <input type="checkbox"/> Workstations |
| <input type="checkbox"/> 34. | <input type="checkbox"/> Terminals |
| <input type="checkbox"/> 35. | <input type="checkbox"/> Printers/Network Printers |
| <input type="checkbox"/> 36. | <input type="checkbox"/> Cluster Controllers |
| <input type="checkbox"/> 37. | <input type="checkbox"/> CD-ROM |
| <input type="checkbox"/> 38. | <input type="checkbox"/> Fax/Modem Boards |

REMOTE/WIRELESS COMPUTING

- | | |
|------------------------------|--|
| A | B |
| <input type="checkbox"/> 39. | <input type="checkbox"/> PDAs |
| <input type="checkbox"/> 40. | <input type="checkbox"/> PCMCIA Devices |
| <input type="checkbox"/> 41. | <input type="checkbox"/> Wireless Data Services |
| <input type="checkbox"/> 42. | <input type="checkbox"/> Wireless Data Equipment |
| <input type="checkbox"/> 43. | <input type="checkbox"/> Wireless LANs |
| <input type="checkbox"/> 44. | <input type="checkbox"/> Cellular Equipment & Services |

INTERNET/INTRANET

- | | |
|------------------------------|--|
| A | B |
| <input type="checkbox"/> 45. | <input type="checkbox"/> Internet Access Service |
| <input type="checkbox"/> 46. | <input type="checkbox"/> Firewalls/Security |
| <input type="checkbox"/> 47. | <input type="checkbox"/> Web Servers |

☐ 107 ☐ None of the above (1-99)

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7 **Check ALL that apply in Columns A and B:**

A. The following network platforms are currently installed:

B. The following network platforms are planned for purchase:

NETWORK PROTOCOLS

- | | |
|------------------------------|---|
| A | B |
| <input type="checkbox"/> 01. | <input type="checkbox"/> SNA |
| <input type="checkbox"/> 02. | <input type="checkbox"/> DECnet |
| <input type="checkbox"/> 03. | <input type="checkbox"/> TCP/IP |
| <input type="checkbox"/> 04. | <input type="checkbox"/> Novell IPX/SPX |
| <input type="checkbox"/> 05. | <input type="checkbox"/> APPC/APPN/LU 6.2 |
| <input type="checkbox"/> 06. | <input type="checkbox"/> NETBIOS |
| <input type="checkbox"/> 07. | <input type="checkbox"/> AppleTalk |
| <input type="checkbox"/> 08. | <input type="checkbox"/> NFS |
| <input type="checkbox"/> 09. | <input type="checkbox"/> IPv6 |
| <input type="checkbox"/> 10. | <input type="checkbox"/> SNMP/SNMPv2 |
| <input type="checkbox"/> 11. | <input type="checkbox"/> Other (please specify) _____ |

NETWORK OPERATING SYSTEM

- | | |
|------------------------------|---|
| A | B |
| <input type="checkbox"/> 12. | <input type="checkbox"/> Microsoft (LAN Manager) |
| <input type="checkbox"/> 13. | <input type="checkbox"/> Novell (NetWare 2.X, 3.X) |
| <input type="checkbox"/> 14. | <input type="checkbox"/> Novell (NetWare 4.X) |
| <input type="checkbox"/> 15. | <input type="checkbox"/> Windows NT |
| <input type="checkbox"/> 16. | <input type="checkbox"/> Windows NT/Advanced Server |
| <input type="checkbox"/> 17. | <input type="checkbox"/> LocalTalk (AppleTalk) |
| <input type="checkbox"/> 18. | <input type="checkbox"/> Banyan (VINES) |
| <input type="checkbox"/> 19. | <input type="checkbox"/> IBM (LAN Server) |
| <input type="checkbox"/> 20. | <input type="checkbox"/> IBM (PC LAN Program) |
| <input type="checkbox"/> 21. | <input type="checkbox"/> Artisoft (LANtastic) |
| <input type="checkbox"/> 22. | <input type="checkbox"/> Digital (Pathworks) |
| <input type="checkbox"/> 23. | <input type="checkbox"/> Other (please specify) _____ |

LAN ENVIRONMENT

- | | |
|------------------------------|---|
| A | B |
| <input type="checkbox"/> 24. | <input type="checkbox"/> 4M Token Ring |
| <input type="checkbox"/> 25. | <input type="checkbox"/> 16M Token Ring |
| <input type="checkbox"/> 26. | <input type="checkbox"/> Ethernet |
| <input type="checkbox"/> 27. | <input type="checkbox"/> Fast Ethernet |
| <input type="checkbox"/> 28. | <input type="checkbox"/> 100vg Any LAN |
| <input type="checkbox"/> 29. | <input type="checkbox"/> FDDI |
| <input type="checkbox"/> 30. | <input type="checkbox"/> LocalTalk |
| <input type="checkbox"/> 31. | <input type="checkbox"/> 10Base-T |
| <input type="checkbox"/> 32. | <input type="checkbox"/> ATM |
| <input type="checkbox"/> 33. | <input type="checkbox"/> Other (please specify) _____ |

COMPUTER OPERATING SYSTEM

- | | |
|------------------------------|---|
| A | B |
| <input type="checkbox"/> 34. | <input type="checkbox"/> DOS |
| <input type="checkbox"/> 35. | <input type="checkbox"/> Unix/Xenix/AIX |
| <input type="checkbox"/> 36. | <input type="checkbox"/> OS/2 |
| <input type="checkbox"/> 37. | <input type="checkbox"/> OS/2 Warp |
| <input type="checkbox"/> 38. | <input type="checkbox"/> IBM MVS |
| <input type="checkbox"/> 39. | <input type="checkbox"/> IBM VM |
| <input type="checkbox"/> 40. | <input type="checkbox"/> Digital VMS |
| <input type="checkbox"/> 41. | <input type="checkbox"/> Macintosh |
| <input type="checkbox"/> 42. | <input type="checkbox"/> Windows |
| <input type="checkbox"/> 43. | <input type="checkbox"/> Windows 95 |
| <input type="checkbox"/> 44. | <input type="checkbox"/> NT |
| <input type="checkbox"/> 45. | <input type="checkbox"/> Solaris |
| <input type="checkbox"/> 46. | <input type="checkbox"/> Other (please specify) _____ |
| <input type="checkbox"/> 47. | <input type="checkbox"/> None of the above (1-46) |

8 **What is your scope and involvement in purchasing decisions for network products & services for your enterprise?**

A. SCOPE

(check one only)

1. ☐ Corporate/Enterprise
2. ☐ Department
3. ☐ None

B. INVOLVEMENT (check all that apply)

1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate
4. ☐ Determine the need
5. ☐ None

9 **What is the total number of LANs, workstations/nodes at this location/ in your organization?**

At this location:

- | | |
|---|--------------------------|
| LANs | Workstations/
Nodes |
| 1. <input type="checkbox"/> 5,000+ | <input type="checkbox"/> |
| 2. <input type="checkbox"/> 1,000 - 4,999 | <input type="checkbox"/> |
| 3. <input type="checkbox"/> 100 - 999 | <input type="checkbox"/> |
| 4. <input type="checkbox"/> 50 - 99 | <input type="checkbox"/> |
| 5. <input type="checkbox"/> 10 - 49 | <input type="checkbox"/> |
| 6. <input type="checkbox"/> 1 - 9 | <input type="checkbox"/> |

Entire organization:

- | | |
|---|--------------------------|
| LANs | Workstations/
Nodes |
| 1. <input type="checkbox"/> 5,000+ | <input type="checkbox"/> |
| 2. <input type="checkbox"/> 1,000 - 4,999 | <input type="checkbox"/> |
| 3. <input type="checkbox"/> 100 - 999 | <input type="checkbox"/> |
| 4. <input type="checkbox"/> 50 - 99 | <input type="checkbox"/> |
| 5. <input type="checkbox"/> 10 - 49 | <input type="checkbox"/> |
| 6. <input type="checkbox"/> 1 - 9 | <input type="checkbox"/> |

10 **Please indicate your involvement in developing/implementing Internet/ Intranet Technologies:** (check all that apply)

- | | | |
|--|---------------------------------------|--------------------------------------|
| 1. <input type="checkbox"/> Recommend/Specify | 2. <input type="checkbox"/> Approve | 3. <input type="checkbox"/> Evaluate |
| 4. <input type="checkbox"/> Determine the need | 5. <input type="checkbox"/> Implement | 6. <input type="checkbox"/> None |

11 **Which of the following hardware platforms are installed/planned in your company?** (check all that apply)

- | | | | | | |
|------------|--------------------------|--------------------------|-----------------|--------------------------|--------------------------|
| | Mainframes | | | Minis | |
| | A - Installed | B - Planned | | C - Installed | D - Planned |
| 1. IBM | <input type="checkbox"/> | <input type="checkbox"/> | 1. IBM | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Amdahl | <input type="checkbox"/> | <input type="checkbox"/> | 2. Digital | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Cray | <input type="checkbox"/> | <input type="checkbox"/> | 3. Tandem | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Hitachi | <input type="checkbox"/> | <input type="checkbox"/> | 4. Unisys | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Unisys | <input type="checkbox"/> | <input type="checkbox"/> | 5. AT&T GIS | <input type="checkbox"/> | <input type="checkbox"/> |
| | | | 6. HP | <input type="checkbox"/> | <input type="checkbox"/> |
| | | | 7. Data General | <input type="checkbox"/> | <input type="checkbox"/> |

What is the total number of Servers/Clients
Installed/planned: (USE NUMBERS ONLY)

E-AT THIS LOCATION	#	F-% with Internet Access
1. Servers	<input type="text"/>	<input type="text"/> %
2. Clients	<input type="text"/>	<input type="text"/> %

Which of the following Servers/Clients do you have
installed/planned: (CHECK ALL THAT APPLY)

	At this location:	Entire organization:
	I-Servers	J-Clients
	K-Servers	L-Clients
01. Power PC	<input type="checkbox"/>	<input type="checkbox"/>
02. Power Mac	<input type="checkbox"/>	<input type="checkbox"/>
03. Mac Other	<input type="checkbox"/>	<input type="checkbox"/>
04. Multi Processor Servers	<input type="checkbox"/>	<input type="checkbox"/>
05. P6	<input type="checkbox"/>	<input type="checkbox"/>
06. Pentium Pro	<input type="checkbox"/>	<input type="checkbox"/>
07. Pentium	<input type="checkbox"/>	<input type="checkbox"/>
08. 486	<input type="checkbox"/>	<input type="checkbox"/>
09. 386	<input type="checkbox"/>	<input type="checkbox"/>
10. 286	<input type="checkbox"/>	<input type="checkbox"/>
11. Risc	<input type="checkbox"/>	<input type="checkbox"/>
12. Other	<input type="checkbox"/>	<input type="checkbox"/>

12 **Estimated gross annual revenue of your entire company/institution:** (check one only)

- | | | |
|--|--|--|
| 1. <input type="checkbox"/> \$10 billion or more | 4. <input type="checkbox"/> \$100 million to \$499.9 million | 7. <input type="checkbox"/> \$5 million to \$9.9 million |
| 2. <input type="checkbox"/> \$1 billion to \$9.9 billion | 5. <input type="checkbox"/> \$50 million to \$99.9 million | 8. <input type="checkbox"/> \$4.9 million or less |
| 3. <input type="checkbox"/> \$500 million to \$999.9 million | 6. <input type="checkbox"/> \$10 million to \$49.9 million | 9. <input type="checkbox"/> None of the above |

13 **Estimated number of employees at this location/in entire organization:**

- | | |
|---|---|
| At this location: | Entire organization: |
| 1. <input type="checkbox"/> Over 10,000 | 1. <input type="checkbox"/> Over 10,000 |
| 2. <input type="checkbox"/> 5,000 - 9,999 | 2. <input type="checkbox"/> 5,000 - 9,999 |
| 3. <input type="checkbox"/> 2,500 - 4,999 | 3. <input type="checkbox"/> 2,500 - 4,999 |
| 4. <input type="checkbox"/> 1,000 - 2,499 | 4. <input type="checkbox"/> 1,000 - 2,499 |
| 5. <input type="checkbox"/> 500 - 999 | 5. <input type="checkbox"/> 500 - 999 |
| 6. <input type="checkbox"/> 499 or less | 6. <input type="checkbox"/> 499 or less |

14 **For which areas outside of North America do you have purchase influence?** (check all that apply)

- | | | |
|------------------------------------|---|---|
| 1. <input type="checkbox"/> Europe | 3. <input type="checkbox"/> South America | 5. <input type="checkbox"/> Middle East |
| 2. <input type="checkbox"/> Asia | 4. <input type="checkbox"/> Australia | 6. <input type="checkbox"/> None |

B597

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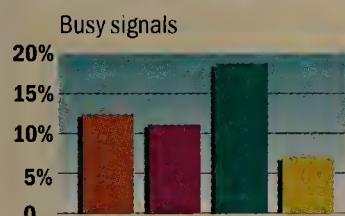
Briefs

■ Users can now arm themselves with **performance reports** on many of the national Internet service providers before they give their business to a single ISP.

Inverse Network Technology, Inc. of Santa Clara, Calif., announced last week that its ISP performance Report Cards are available to private companies.

Inverse tests 17 national ISPs' dial-up connections for factors such as busy signals, modem connections and logon failures for a two-week period each month (see graphic). Using its proprietary software, Inverse makes between 5,000 and 6,000 calls to each provider during the two-week test period and averages each ISP's overall performance.

TRYING TO GET ONLINE



Company:



Users can order Inverse Report Cards on a monthly or yearly basis for approximately \$5,000 and \$40,000, respectively.

© Inverse Network Technology: (408) 987-0760

■ The latest **auction of wireless spectrum** by the Federal Communications Commission turned out to be **something of a bust**. Only \$13.6 million in winning bids were made for slices of the new Wireless Communications Service (WCS) band, compared to \$1.2 billion originally forecast by Congress. The highest net bidder was an affiliate of BellSouth Corp. Once touted as a possible vehicle for wireless Internet access, the WCS band at around 2.3 GHz lost favor. Some of the reasons include its proximity to a new digital audio service, and recent defaults and bankruptcies of previous FCC auction winners.

MCI rejiggers frame relay pricing

Move designed to get users over hump of dual PVCs for disaster recovery.

By David Rohde

Washington, D.C.

MCI Communications Corp. continues the recent industry trend of higher frame relay port prices with an increase that takes effect Wednesday.

But the carrier is offering a carrot with the stick. MCI is also changing its price structure to encourage users to order backup permanent virtual circuits (PVC) into data centers and connect more of their sites in a mesh topology.

To do this, MCI — the only major carrier that charges for PVCs according to usage — is lowering the minimum usage charge on all of its PVCs to \$5 per month.

In such a fashion, users can provision additional PVCs for disaster recovery or separate protocols among data centers and office locations, allowing them to lie dormant until needed, with little financial penalty.

"This will make it easier to deploy more fully meshed networks, which, after all, was the original intention of frame relay," said Steven Taylor, president of Distributed Networking Associates, a consulting firm based in Greensboro, N.C.

The port charge increase, filed recently with the Federal Communications Commission and set to take effect May 7, is actually MCI's second this year. The first, instituted in February, applied to ports of up to 1,536K bit/sec, but the latest increase goes across-the-board to include MCI's newer high-speed ports (see graphic).

In fact, those ports are sporting the biggest price hikes in line with another industry trend — the move to ration demand for T-3 and fractional T-3 circuits, which are in short supply (NW, March 31, page 1).

The new PVC usage structure continues an ongoing effort by MCI to simplify its usage-based concept, which has drawn praise from analysts, but has occasionally proved difficult to explain in user negotiations.

MCI now charges 5 1/2 cents per megabyte of traffic sent

within a PVC's committed information rate (CIR) and 4 1/2 cents per megabyte for traffic marked discard-eligible. MCI has always maintained a minimum usage fee.

But until now, the \$5 minimum only applied to PVCs with CIRs of 16K bit/sec; users reserving higher CIRs were stuck with much higher minimums, such as \$65 a month for 256K bit/sec of

SHELLING OUT MORE MONEY FOR YOUR PORTS

In raising frame relay port prices, MCI is making higher speed ports — and its basic 64K bit/sec port — bear the burden.

Port speed (bit/sec)	Old price per month	New price per month	Increase
64K	\$214	\$228	6.5%
128K	\$396	\$415	4.8%
256K	\$530	\$560	5.7%
384K	\$766	\$810	5.7%
768K	\$1,200	\$1,270	5.8%
1,536K	\$1,850	\$1,980	7.0%
3,072K	\$2,268	\$2,449	8.0%
12,288K	\$5,268	\$5,689	8.0%

reserved bandwidth.

This caused a problem, because users that wanted backup PVCs into data centers would reserve PVCs for much lower CIRs than the principal circuit, thus failing to achieve true redundancy, said Todd Bahner, an MCI frame relay product manager.

Bahner added that some users would even set their backup PVCs at zero CIR, meaning all traffic on a backup circuit would be at risk of discard in case of network congestion.

Under the new price structure, users theoretically could ask for a CIR as high as 10M bit/sec and still pay only \$5 if the circuit were not used during a particular month.

That is one reason why MCI is raising the port charges, Taylor said. "Even on your very high-speed ports you're getting usage CIR for \$5 a month, so somewhere [MCI has] to have a little protection," he said. ■

BT/MCI struts its synergy at Innovation '97

By Denise Pappalardo

Martlesham Heath, England

BT Laboratories, a division of British Telecommunications plc, recently hosted its Innovation '97 conference, this time with a new theme — BT/MCI Communications Corp. synergy.

The company used the occasion to highlight a range of new technologies, such as intelligent networks, intranets and advanced call center tools.

BT demonstrated approximately 60 applications and technologies at the conference it holds here every three years.

The demonstrations served notice that, although the merger between the two telephone company giants is not yet complete, the companies are already working together.

Intelligent networks is one of the key areas in which BT and MCI have been working closely. The aptly named Statistical Heuristic Engine to Reliably and Intelligently Fight Fraud (SHERIFF) telecommunications fraud management system — which was demonstrated at the conference — will let BT and MCI help

their voice customers fight fraudulent use of their services.

SHERIFF uses artificial intelligence technology that recognizes call patterns and develops caller profiling to help detect fraudulent use. The companies



One of the approximately 9,000 attendees at Innovation '97 uses BT's multimedia kiosk.

have been developing this system for their intelligent networks for the past two years.

Intelligent networks are typically proprietary systems developed by each carrier. BT and MCI are already sharing the advances each has made, rather than operating alone like most

other carriers. SHERIFF is expected to be deployed globally later this year.

BT and MCI have been working closely on intranet developments since Concert Internet Plus was announced last year. Fred Briggs, chief engineering officer at MCI, said that while Internet access services are a necessary part of the Concert initiative, intranet services are actually more important.

Briggs will be the chief technology officer at Concert once the merger between BT and MCI is final.

Concert Internet Plus will support international intranet services by the end of this quarter.

BT also plans to use MCI's Vault technology, which was announced earlier this year, to bring computer telephony integration into call center services. Vault will let users simultaneously use a single telephone line to access the Internet and make a voice call. This technology is not expected to be available until sometime next year.

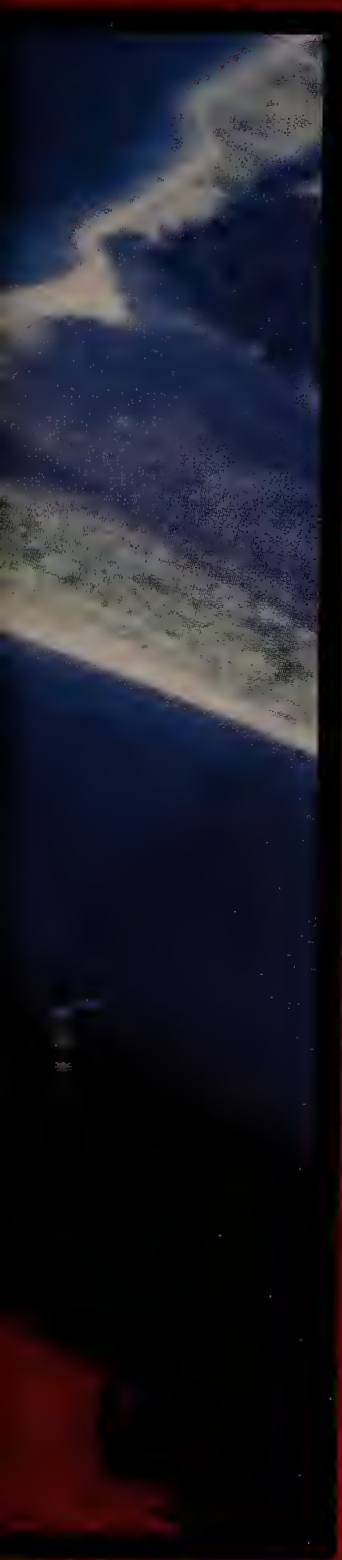
See BT, page 28



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BBN ignites firewall service

By Denise Pappalardo
Cambridge, Mass.

BBN Planet's Internet Site Patrol 3.0 is more than just an upgraded managed firewall service. Through the use of its new 56-bit encryption, the service will

allow the ISP to support multisite intranets and extranets, BBN claimed.

The added 56-bit Data Encryption Standard (DES) security lets BBN perform encrypted tunneling over the Internet, which is the key to safely supporting

multiple sites, said Greg Lebovitz, BBN's director of security products. The tunneling provides a virtual private circuit over the public Internet.

For users that want a secure intranet or virtual private network over the Internet, this is a very clean solution that covers the outsourcing, security and management of their firewalls, said Rebecca Wetzel, direc-

tor of Internet consulting at TeleChoice, Inc., a Verona, N.J.-based consultancy.

The added security also lets BBN open up its customers' networks to outside clients, partners or customers, Lebovitz said.

Handing over control

When BBN first rolled out its Internet Site Patrol service two years ago, the ISP managed every aspect, including adds, drops and changes. With the latest version of its service, BBN is handing the individual client access control piece of the equation back to the customer, Lebovitz said.

SITE PATROL GETS AN ENCRYPTION BOOST

BBN Planet's Internet Site Patrol 3.0 extends the security of firewalls across the 'Net. The service now supports:

- Virtual private networking with 56-bit Data Encryption Standard between multiple sites
- Extranet service that lets network administrators set up private-mode connections for clients, customers or business partners
- Customer control over individual user access to their Intranet and the Internet

BBN uses Trusted Information Systems, Inc.'s (TIS) Gauntlet Firewall for the Site Patrol service. BBN developed a character-based customer interface with TIS that lets users manage their company's access controls. A graphics-based interface is being developed and is expected to be available toward year-end, Lebovitz said.

"Access control is a big headache for users and ISPs," Wetzel said. Because users now have control of dropping or adding a user to the net at their fingertips, users do not have to wait for their ISP to do it in one, two or five hours, Wetzel said. If someone is fired, for instance, an Internet Site Patrol customer can immediately cut off that user's access.

The BBN service eases user access by offering trusted routing among multiple sites, something individual users cannot do, Lebovitz claimed.

Internet Site Patrol 3.0 is available now, with a \$5,000 installation fee and a \$2,500 monthly service fee for each firewall.

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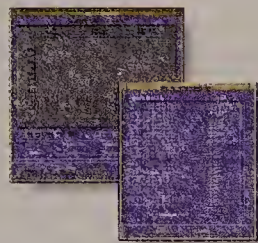
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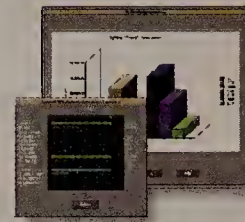
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BT

Continued from page 25

Lotta dough

BT invests \$500 million in its lab research projects every year and uses 80% of those developments in services, said Stewart Davies, general manager of systems engineering operations at BT Labs. BT plans to increase the practical application of its research in actual services to 90% in the near future, Davies said.

Joint development is not a new concept for BT and MCI. The companies have been working together for the past three years on Concert Communications, which focuses on linking data and 'Net services between the U.S. and the U.K. ■

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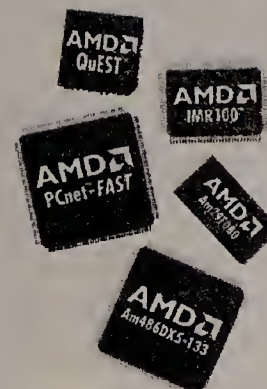
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Carriers offer corporate customers a win-win situation

Interested in cutting your corporate phone bill while bolstering your marketing presence? Consider implementing an affinity program for your customers.

The idea is simple. Your company makes an agreement with a telecommunications carrier to market its products to your customers, and the carrier agrees to do the same.

For example, FTD, Inc., an affinity partner with Sprint Corp., offers its corporate customers a special set of Sprint services and prices. Sprint, in turn, makes FTD products available to its customers. Sprint and FTD get additional marketing channels, while the customers get discounted prices and special promotions.



**Daniel Briere
and Christine Heckart**

AT&T is trying a different angle with American Airlines, Inc. When passengers use AT&T in-flight phones, they earn AAdvantage Miles. American's customers have an additional incentive to fly the airline and communicate with the world below at the same time.

Affinity marketing has gotten to the point where it can be almost anything. Most carriers have special divisions assigned to affinity marketing programs and options for companies of all shapes and sizes.

The carriers are looking to partner with high-interest companies to offset the failings of their constant bombardment of television commercials, direct (junk) mailings and untimely telemarketing calls.



Most carriers and even resellers see affinity plans as marketing tools, providing additional revenue through nontraditional, less costly distribution channels.

The Big Three offer many options, partnerships and customization opportunities. In fact, affinity marketing has become an important factor in their marketing departments, with significant revenue and budgets.

As to be expected, each carrier puts a different spin on what size customers it caters to and the requirements it has for partnerships.

The carriers also offer a variety of terms for the prospective partnership: commissions, deep discounts and marketing partnerships. Commissions may or may not be a standard part of every affinity partnership — they depend on the business objectives of the organization.

Some companies have the objective of making additional revenue through the partnership; others want to explore a unique marketing option in an effort to reach more customers. Some just want a break in their monthly telecommunications bill.

If commissions are not part of the deal, most carriers are willing to invest additional money in marketing programs and offer extended discounts or more creative, value-added options that are quite frequently developed between the carrier and the partnering customer.

MCI Communications Corp., for example, frequently joins with companies that don't desire or are not allowed — usually for tax purposes — to accept commissions.

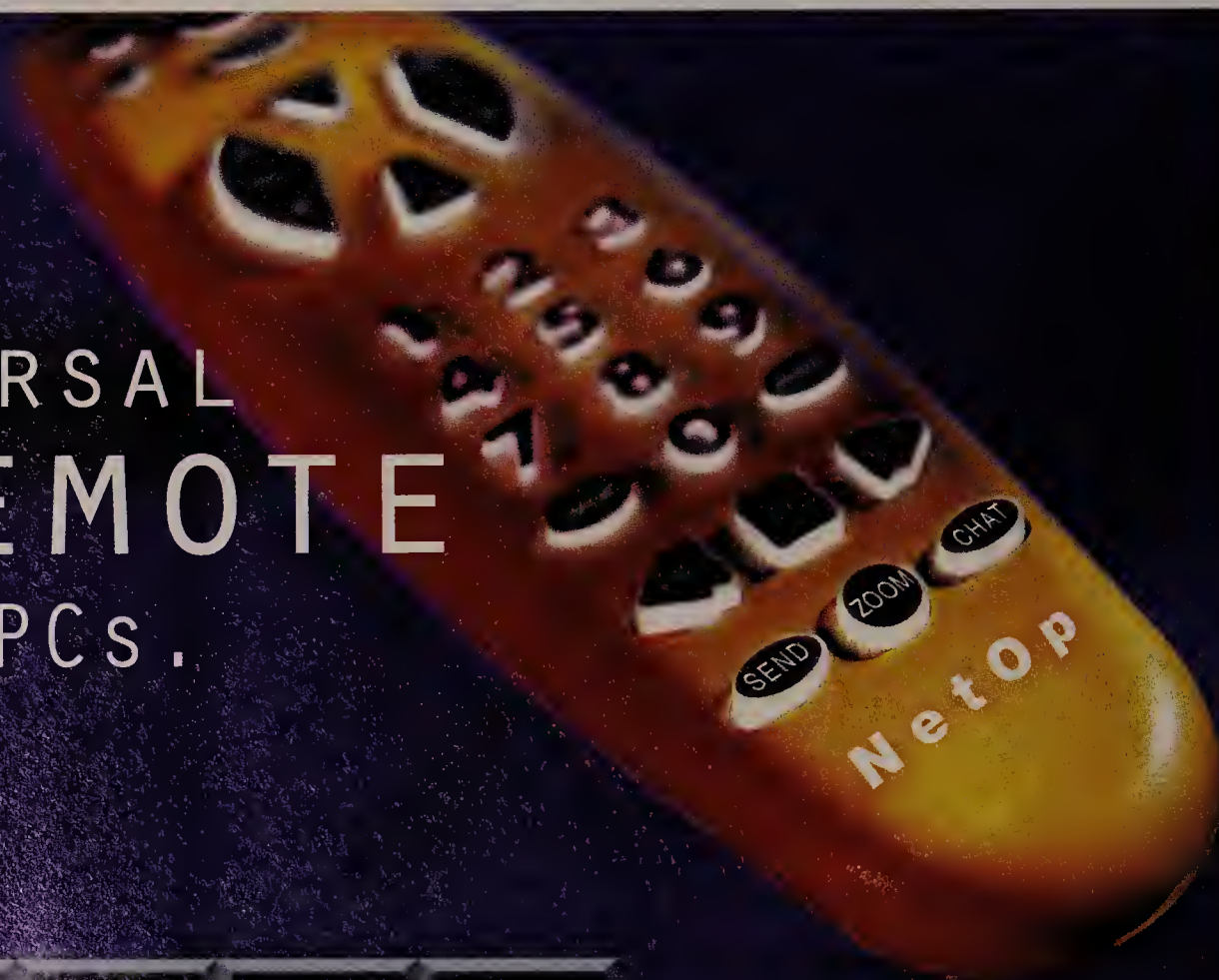
Instead, the carrier may put the commission money into marketing programs or provide some sort of value-added option — for example, a software package.

Overall, the terms of an affinity agreement can be anything to which two parties are willing to agree.

Affinity programs are not a new marketing scheme, but their use is spreading.

Briere is president and Heckart is director of broadband with TeleChoice, Inc., a consultancy in Verona, N.J. They can be reached at dbriere@telechoice.com and heckart@telechoice.com.

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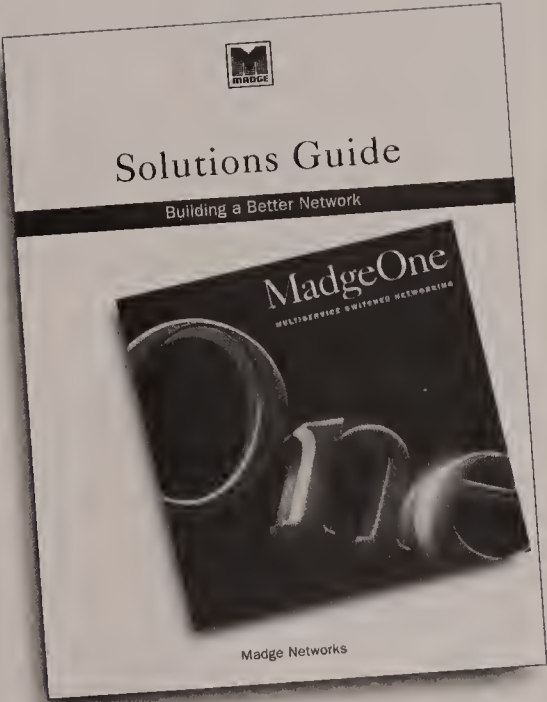
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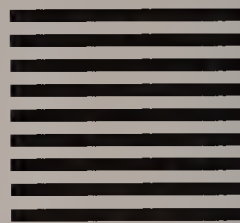
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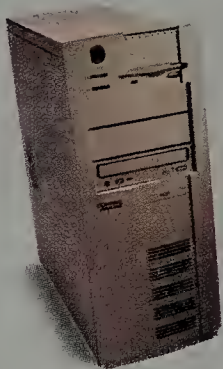
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Local Networks

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Briefs

■ **NetManage, Inc.** last week introduced a version of its **PC-to-Unix connectivity software** that lets users tap into graphical X Windows applications via a Web browser. Chameleon UNIX-Link 97 lets users go to a Web



page and launch X applications without having to undergo the typical Unix logon process. The new version also has improved remote management features.

Chameleon UNIXLink 97 costs \$400 and will be available this month. The product is a free upgrade for customers with current maintenance contracts.

© NetManage: (408) 973-7171

■ **Start-up Foundry Networks, Inc.** last week unveiled a new member of the NetIron gigabit switching router family. The NetIron16, which will be demonstrated at NetWorld+Interop 97 this week, supports 16 10M/100M bit/sec Ethernet ports and a one- or two-port Gigabit Ethernet uplink module.

Pricing starts at \$15,995. The Gigabit Ethernet uplink module costs \$3,495 for the single-port and \$5,495 for the dual-port card. All products will ship in June.

© Foundry: (408) 542-0835

■ **Madge Networks, Inc.** this week will unveil a module that doubles the backplane speed of the company's LANswitch hub to 2.5G bit/sec, with throughput of 2M packet/sec. The LANswitch hub — with the new LSA+ module — will be on display at NetWorld+Interop 97. The module costs \$9,995.

© Madge: (408) 955-0700

Tracking the move to IP-only LANs

NetWare and Windows NT customers have a tough choice, according to panelists.

By Christine Burns
Las Vegas

TCP/IP may be en vogue, but it still has a way to go before it becomes the primary LAN protocol.

Sure, TCP/IP scales well and eases Internet access. But is that enough for LAN managers to put up with the pain of swapping out client software across-the-board and retraining administrators to manage dynamic TCP/IP addresses?

A panel of industry consultants will explore such questions during the NetWorld+Interop

97 general conference session, How to run TCP/IP-only NetWare and Windows NT networks (Tuesday, May 6, 2:00 to 3:30 p.m.).

"[Users] are consolidating to not more than two network protocols, and IP is always one

acceptance of IP everywhere else in the industry, it's likely that most LAN segments will be using it soon, too," he said.

The panel will discuss the headway Microsoft Corp. and Novell, Inc. are making to accommodate TCP/IP-only networks, said lead panelist Bruce Robertson, program manager of global network strategies for META Group, Inc. in Reston, Va.

While most companies have already started to standardize on a single network operating system (NOS), they have not yet settled on one network protocol, he said.

IP in the LAN

According to Robertson, the forces that are likely to drive TCP/IP into the LAN are Internet access and a skyrocketing number of business-critical applications that require TCP/IP.

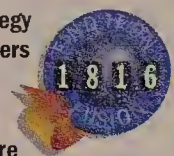
The network applications that have lagged behind the TCP/IP curve are file, print and directory services provided by the PC-based NOSes, he said. These services employ IBM's NETBIOS, Microsoft's NETBEUI or Novell's IPX as the protocol by which information is passed over the wire.

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● An overview of Novell's strategy for moving users to IP

● A look at why some users are moving their SNA networks to IP



Fusion

The technical reasons for the TCP/IP lag in the LAN are far from trivial, said Rand Morimoto, a panel member and president of Inacom Information Systems, Inc. in Oakland, Calif.

Morimoto explained that to establish a TCP/IP-only network, an administrator must install a protocol stack on every desktop machine. The administrator must also update and tune

all the network routers for handling a single protocol instead of multiple ones.

Additionally, administrators accustomed to the plug-and-play nature of LAN protocols such as IPX have to learn the complicated tools for managing dynamic TCP/IP addresses such as

Morimoto explained that to establish a TCP/IP-only network, an administrator must install a protocol stack on every desktop machine.

Domain Naming System and Dynamic Host Configuration Protocol servers.

"Then there is the issue of having stuff that works just fine under the old protocol break when you fire up TCP/IP," Morimoto said.

See IP-only, page 45

NETWORLD+INTEROP 97

of them," said panelist Russ McBrien, who is the Wintel Initiative manager for Hewlett-Packard Co.'s Professional Services group.

"So given the widespread

ATM vendors put MPOA to the test at Interop

By Jodi Cohen
Las Vegas

The ATM Forum this week here at NetWorld+Interop 97 will host the first-ever multivendor demonstration of Multi-Protocol over ATM (MPOA).

LEADING THE WAY WITH MPOA

A sampling of vendors participating in the ATM Forum's MPOA interoperability demo:

► Bay	► Interphase
► Cabletron	► Madge
► Cisco	► Network General
► FORE	► Newbridge
► IBM	

Systems, Inc., IBM, Interphase Corp., Madge Networks, Inc., Network General Corp. and Newbridge Networks, Inc. One notable nonparticipant is 3Com Corp., which is focusing on its Fast IP Layer 3 switching implementation, industry observers said.

The demo will include ATM switches from Cisco, FORE and Newbridge in the backbone network working with Newbridge route servers and edge devices. Newbridge is the only vendor shipping MPOA-based products, so others will use beta versions of their products for the interoperability test.

"There's been a lot of confusion over the last six months as vendors have been scrambling to announce Layer 3 switching schemes," said Eric Andrews, director of product marketing at Newbridge. "For the first time, we have a standards-based Layer 3 switching solution that is backed by lots of vendors."

What is MPOA?

MPOA allows ATM backbones to support Layer 3 protocols and applications. It also lets these protocols and applications

See MPOA, page 40

The demo, which will include gear from at least nine vendors, highlights the industry's first standards-based Layer 3 switching scheme. The ATM Forum last week was expected to rubber-stamp the MPOA specification — which allows IP, IPX and other data to be forwarded over ATM backbones — at its annual meeting in Chicago.

Vendors planning to take part in the demo include Bay Networks, Inc., Cabletron Systems, Inc., Cisco Systems, Inc., FORE

QUICK TAKE: RAIDPRO

Storage Dimensions' new external storage system

Storage Dimensions, Inc. this week will introduce RAIDPro, an external RAID storage system for entry-level and midrange servers running Windows NT and NetWare.

The product provides an alternative to storage offerings that vendors build into their own servers. Among the arguments for external RAID systems is that they can be used with different vendors' servers, such as those from Compaq Computer Corp., Hewlett-Packard Co. and IBM. RAIDPro also features triple-redundant power supplies and the ability to be upgraded without being taken down.


RAIDPro comes in high-end and low-end models and supports three to six 2.1G-byte or 4.3G-byte disk drive modules. The low-end VL model with three 2.1G-byte drives costs \$4,475, while the high-end XL version with three 4.3G-byte drives costs \$7,830.

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Windows 95 and NT shipments booming

By Marc Ferranti

Corporate acceptance of Windows 95 and NT will fuel another strong year for the operating system market, according to market research firm Dataquest, Inc.

Operating system software shipments this year are projected to reach 86.5 million units, up 18.8% from 1996 totals.

While Windows 95 showed the best growth in 1996, Dataquest anticipates NT will lead the way this year with a 156% increase in units shipped over units shipped last year. As 16-bit operating system shipments decline, shipments of Windows NT are expected to almost equal Windows 3.1 unit shipments this year. Dataquest expects NT shipments to total 41.2 million units by 2000.

"Microsoft [Corp.] has been out there selling the need for a reliable and robust desktop environment, but it takes corporations some time to respond," said Chris Le Tocq, director and principal analyst at Dataquest's personal computer software program. Corporations are now upgrading to Windows 95, which was released in August 1995, he said.

The same type of delayed response is happening to NT 4.0, released last year.

"People started taking a look at it and saying, 'Guess what, this works.' So we expect sales to grow rapidly in the second half of the year," Le Tocq said.

On the server side, operating system sales are being driven by World-Wide Web server installations. "We see a market explosion for Web servers," Le Tocq said.

Major systems vendors are offering NT-based servers as entry-level machines, Le Tocq noted. High-end requirements are still being filled by Unix, he said.

"[Sun Microsystems, Inc.'s President and CEO] Scott McNealy is quite right that, in terms of reliability and scalability, NT is where Unix was two years or so ago," Le Tocq said.

Dataquest compiles historical data from information it gets from vendors, channels and users. For forecasts, Dataquest checks with hardware vendors to see what systems will be shipping in the next few years and looks at user buying trends.

For more information, contact Dataquest at (408) 468-8000.

Ferranti is a correspondent with the IDG News Service in New York.

Ellison halts pursuit of Apple . . . for now

By Torsten Busse

Oracle Corp.'s Chairman and CEO Larry Ellison last week said that for now he is not trying to acquire Apple Computer, Inc., the financially troubled desktop computer and server maker.

In a prepared statement, Ellison said he has "decided not to pursue any transaction involving Apple Computer, Inc. or to otherwise seek control of that firm."

He did not reveal why he is backing away from takeover plans, which he announced about a month ago and has commented on publicly many times.

Ellison also stated he has not purchased Apple stock, nor is he engaged in discussions with Apple, its shareholders or potential investors concerning any transaction involving the company.

However, Ellison said that he "remains interested in developments at Apple, and that [I] may purchase stock for investment purposes or otherwise, or revisit in the future [my] decision regarding an

acquisition or control of that firm."

In late March, Ellison stated he was forming an investment group to look into the possibility of taking over Apple. He has said he would replace Apple's upper management, stepping into the top spot himself. He also said that Oracle was not going to be involved in any proposed transaction.

Apple officials declined to comment on Ellison's statement. "However, we are stating that we have a clearly articulated strategy and a detailed plan to return the company to profitability," an Apple spokeswoman said. The

spokeswoman also said Apple has a seasoned management team and has undertaken a series of initiatives over the last year to streamline the business, improve quality and sharply focus on its core markets.

Busse is a correspondent with the IDG News Service in San Francisco.



Oracle's Ellison

BusinessBriefs

Ten-year **Novell, Inc.** veteran **Thomas Arthur** has left his post as the company's top executive in charge of directory services to take a job with **ActivCard S.A.**, a French firm specializing in smart card, token and digital signing technologies. Arthur will serve as president of ActivCard's newly formed U.S. division based in Redwood City, Calif.

Formerly vice president and general manager of Novell's Internet Infrastructure Division, Arthur was charged with pushing industry partners such as Hewlett-Packard Co., Sun Microsystems, Inc. and IBM to license and use Novell Directory Services as the directory service for their operating systems.

Arthur is the second senior executive to leave Novell this month, following **Carolyn Rose**, senior vice president and general manager of education, who departed to pursue other interests.

ATM vendor **FORE Systems, Inc.** last week announced financial results for its fourth quarter

and fiscal year ended March 31. Revenue totaled \$101.3 million, an increase of 35% from the \$75.3 million reported in the fourth quarter last year.

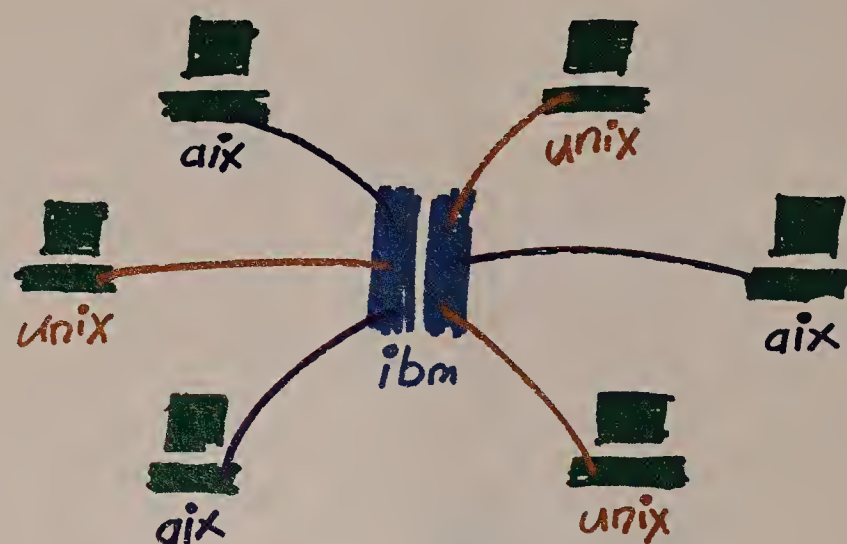
Earnings — not including an \$8.3 million charge from a litigation settlement by FORE's Alantec Corp. subsidiary — totaled \$9.2 million. Revenue for the year totaled \$395.3 million, an increase of 68% from the \$235.2 million reported for the 1996 fiscal year.

Yearly earnings more than quadrupled from \$9.7 million last year to \$41.5 million for the fiscal year just ended. FORE attributed its growth to sales of new ATM workgroup switches, including the ForeRunner 155M bit/sec ATM switch, which reduced the cost-per-seat for ATM to less than \$1,000.

Windows NT systems integrator **Vanstar Corp.** has signed a major reseller agreement with **BlueCurve, Inc.** The contract enables Vanstar to use BlueCurve's Dynameasure 1.5 product family for capacity planning and measuring the performance of NT systems installed by Vanstar.



Novell's Arthur



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MPOA

Continued from page 37

take advantage of ATM's quality-of-service features. MPOA is based on an enhanced version of LAN Emulation (LANE) and the Next Hop Resolution Protocol (NHRP), along with other technologies. Where LANE provides Layer 2 bridging, NHRP provides Layer 3 shortcut routing.

But MPOA's shortcut routing scheme

only works in ATM networks, so the industry is struggling to define a Layer 3 switching standard for frame-based networks.

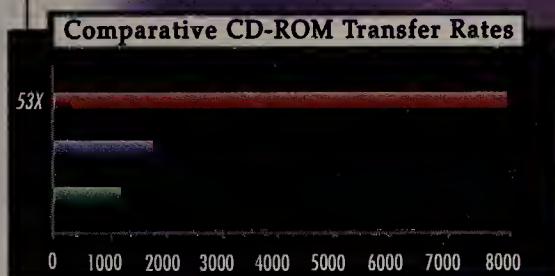
The Internet Engineering Task Force's Multi-protocol Label Switching workgroup is working on such a standard, but the specification probably will not be ready until next year.

The MPOA interoperability demo will take place in the ATM Forum's Solutions Showcase at Interop Booth 2491. ■

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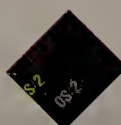
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NETWORLD+INTEROP 97

3Com primes policy management for VLANs

By Jodi Cohen
Las Vegas

3Com Corp. this week will unveil policy-based management software that

should make setting up and administering virtual LANs easier.

VLANs are designed to ease network administration, create logical work-

groups and provide increased security.

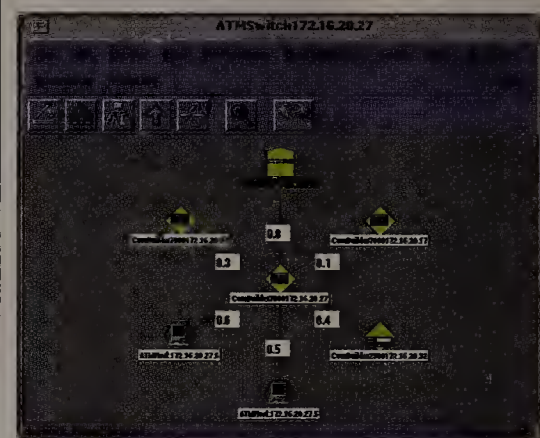
But only about 200 3Com customers are using VLANs, according to Sunil Kishen, the company's product manager of ATM and VLAN network management. But he expects the number to grow as VLANs become more useful, with features such as 3Com's new policy-based management tools. 3Com is rolling out these tools

as part of its Transcend Enterprise Manager Unix 4.2 release here at NetWorld+Interop 97.

Among the software's most useful features is its ability to assign priorities to different net traffic types. For example, traffic priority policies can be set up by media access control address, IP subnet or network protocol.

The software lets customers set VLAN policies centrally, enforce them in LAN switches, and monitor and report on VLAN performance. The software also automates VLAN configuration, which reduces the time and cost involved in managing a net by eliminating the need to manually make end-user moves and changes.

On the security front, 3Com's improved management software lets net managers place unrecognized end users into a default VLAN separate from the rest of the network.



3Com's VLAN policy services reduce network administration time and costs with autoconfiguration capabilities.

How it works

Customers can take advantage of 3Com's VLAN policy services using a combination of tools. Net managers set policies in Transcend Enterprise Manager, which works with a VLAN server that houses a mapping database. SmartAgent software embedded in all 3Com switches enforces the policies.

Transcend Enterprise Manager downloads policies directly into each switch's SmartAgent software. When a user connects to a switch port, the SmartAgent determines the user's VLAN membership based on the enforced policy and by consulting with a VLAN server, then ties the user into the correct VLAN.

3Com is not the first vendor to offer policy-based management: Rival Cabletron Systems, Inc. provides policies as part of its SecureFast Virtual Networking products. Also, Cisco Systems, Inc. recently announced it will offer policy services in its Catalyst 5500, industry observers said.

3Com will first roll out policy-based services for its CoreBuilder 7000 and SuperStack II switches. The vendor will add support for all other switches in the second half of the year. Also, 3Com plans to add more policies and policy combinations, Kishen said.

Transcend Enterprise Manager Unix 4.2 costs \$9,495 and will ship this month.

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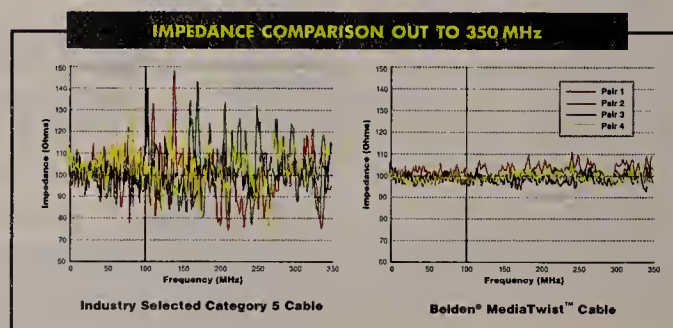


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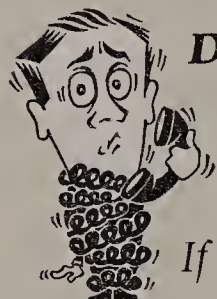
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IP-only

Continued from page 37

moto said. Specifically, he pointed to older client machines that might not have enough memory to support TCP/IP and legacy print servers and E-mail applications that speak only IPX.

IP and IPX together

Vendors have shipped products that make managing mixed protocol networks a little easier.

There are several IP-to-IPX gateways on the market that allow IPX clients to access resources residing on TCP/IP networks.

Windows NT Server 4.0 not only has strong TCP/IP underpinnings, but also allows legacy NETBIOS machines and NetWare IPX clients and servers to tap into NT services.

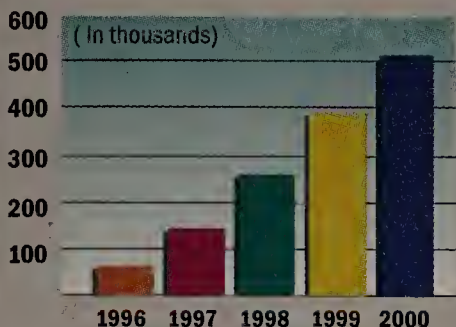
And Novell currently offers NetWare-IP, server software that lets IPX traffic run over TCP/IP.

Additionally, the next major release of

HANGING ON TO THOSE IPX NETS

Novell customers not ready to embrace TCP/IP-only networks right away are expected to gobble up IP-to-IPX gateways in the years ahead.

Worldwide IP-to-IPX gateway installations



SOURCE: IOC, FRAMINGHAM, MASS.



Waiting for Microsoft's Wolfpack

Waiting for Microsoft Corp. to deliver on its promised Wolfpack initiative to add server clustering capabilities to Windows NT is a lot like waiting for the Chicago Cubs to win the World Series: You know it will happen sometime, you're just not sure if it will be in your lifetime.

Clustering involves treating a group of network servers and their subsystems as a single entity when viewed from a client system.

This provides high reliability because the failure of one or more pieces of hardware is automatically compensated for by the rest of the cluster.

Microsoft's Wolfpack plan is modest: The first part calls for one server to back up another in a process called failover.

You wouldn't expect that to be difficult to achieve. After all, Novell, Inc., Vinca Corp. and others have been providing such technology for years.

Yet Microsoft has continuously postponed the ship date for its failover technology, which is now supposedly due this fall.

The second component of Wolfpack, which calls for full-blown server clustering, won't be generally available until next year.

Meanwhile, Novell took the wraps off its Wolf Mountain clustered server initiative in March. The company demonstrated a group of 12 four-processor servers acting in concert as a load-balancing cluster.

But the most impressive part of

Novell's announcement was that this technology would be operating system-independent, meaning it would be useful for NetWare, Windows NT, Unix or just about any other server operating system.

This appears to have sent Microsoft back to the clustering drawing board.

Just last month, the Redmondites emerged, flanked by their favorite hardware partners Intel Corp. and Compaq Computer Corp., to announce plans for a standard set of high-speed communication interfaces for server clusters, dubbed the Virtual Interface Architecture.

Surprisingly, the specification will be media-, processor- and operating system-independent, which may be a first for a Microsoft-instigated specification.

Oh, yes, even Novell signed up to support the initiative.

It may be too much to hope that Novell, Microsoft and the rest partake in some real "coopetition" to bring multi-vendor clustering technology to reality soon.

Then again, even the Cubs won a game recently after losing their first 14. So you never know.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at dkearns@msn.com.

Tip of the week

While you may want to avoid thinking about it, the year 2000 and its attendant computer-related problems are almost upon us. The Year2000 Information Network's Web site (<http://web.idirect.com/~mbsprog/>) provides a wealth of information on the subject.

IntranetWare will let users run TCP/IP applications natively when the software ships next year.

Moving on

If customers do want to move beyond protocol coexistence, the optimal time to migrate all LAN segments to TCP/IP is during a major NOS upgrade,

Morimoto said.

HP's McBrien agreed.

"An operating system change — whether it is a straight upgrade or a move to a new one — means that you will already be changing large chunks of your environment, so the switch to IP can just become part of that change," he said. ■

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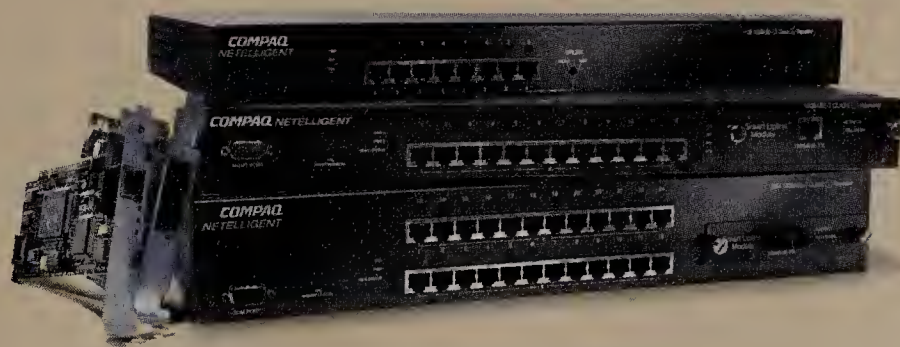
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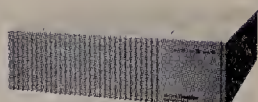
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ATM switches are a powerful tool for building networks. They're fast. They handle data, video, and voice. With them, you can build a backbone that recovers rapidly from failure and dynamically distributes loads around the network. ATM can integrate local and wide-area networking in a way that's never been possible before. And ATM is based on public standards.

But ATM switches aren't identical. Powerful custom chip designs and advanced software can deliver strong benefits in real networks. In this document, we discuss some issues you should consider when planning an ATM network.

But other issues are also important. Physical interface range and density, for example. How workstations are assigned to emulated LANs (some switches do this statically, by port, while others are more flexible). How many emulated LANs can be supported, and how many clients within each emulated LAN can be supported. The ability to synchronize the switch's timing to an outside source, such as a carrier. Level of support for multipoint circuits (they're used for video broadcast).

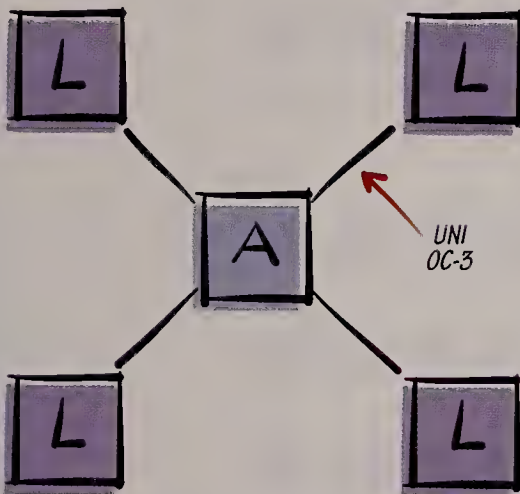
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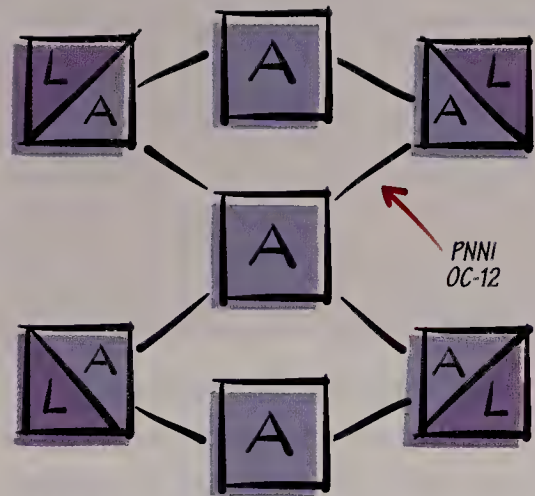
In the real world, LANs and ATM must be tightly integrated.

Once upon a time the networking world had a dream—that all networks would consist of ATM-equipped devices, including workstations. It's a great vision, and today there are a few networks in which that dream is actually being realized. But the great majority of real-world applications don't work that way today. Workstations are equipped with Ethernet, Token Ring, or Fast Ethernet NICs. ATM is used as a high-speed, failure-resistant, standards-based backbone, and for access to wide-area ATM networks.

So an ATM switch needs to effectively support information that begins as packets. If the switch is flexible enough to directly support Ethernet, Token Ring, Fast Ethernet, and FDDI, a high-speed SAR (segmentation and reassembly) function must be embedded into the switch. If the SAR can operate at OC-12c / STM-4c (622 Mbps), then LAN-to-ATM conversions won't be slowed down.



Separate LAN & ATM Switches—LAN-to-ATM uplinks a weak point



Integrated Multi-layered Switches—Network-wide load balancing and instantaneous rerouting around failures

The advantage of multi-layer LAN/ATM switches is simple. Wiring-closet switches that have real ATM switching—not just ATM uplinks—can be meshed into the backbone with PNNI (private network-to-network interface). That means genuine load-balancing and rapid recovery from link failure.

FEATURE	Xylon OMNI-9	3Com 7000HD	Boj Centillion	Cisco LS1010	Fore ASX-1000
ETHERNET	Yes	Yes	Yes	No	No
TOKEN RING	Yes	No	Yes	No	No
FAST ETHERNET	Yes	Yes	Yes	No	No
FDDI	Yes	No	No	No	No

Even a switch that can't support LAN interfaces needs to deal with data coming from LAN switches. And since the workstations sitting behind the LAN switches don't have ATM interfaces, they can't be flow-controlled. So effective buffering, large buffers, and intelligent cell discard mechanisms are critical.



A switch needs the power and structures to move all the information.

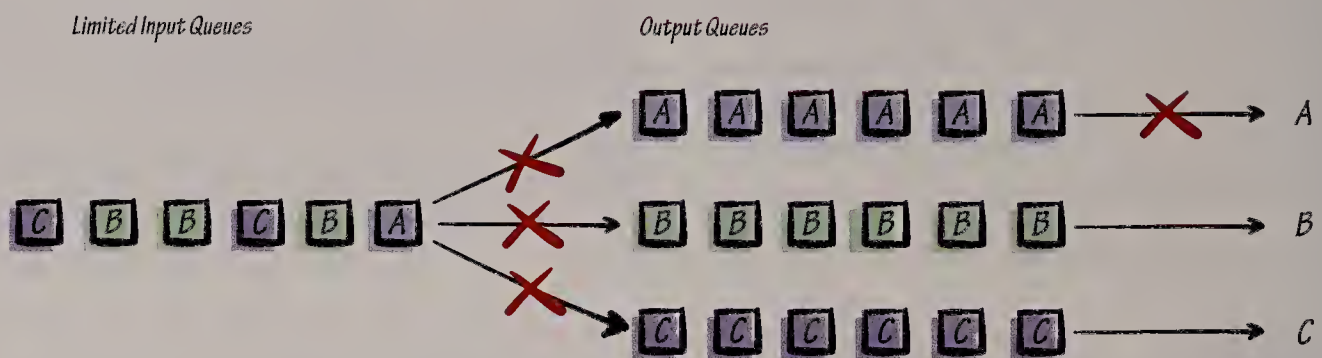
A simple architecture uses a central switching engine, surrounded by I/O modules; all traffic moves through the central engine. This design usually works very well when lightly loaded. However, as more and more I/O modules are added, the load on the switching engine increases. And central switching creates a possible single point of failure.

The alternative—a full switching matrix—is more complex to design. It requires that every module be a switching engine, with a full-duplex path to every other module. The interior of the switch is a fully-interconnected mesh. The

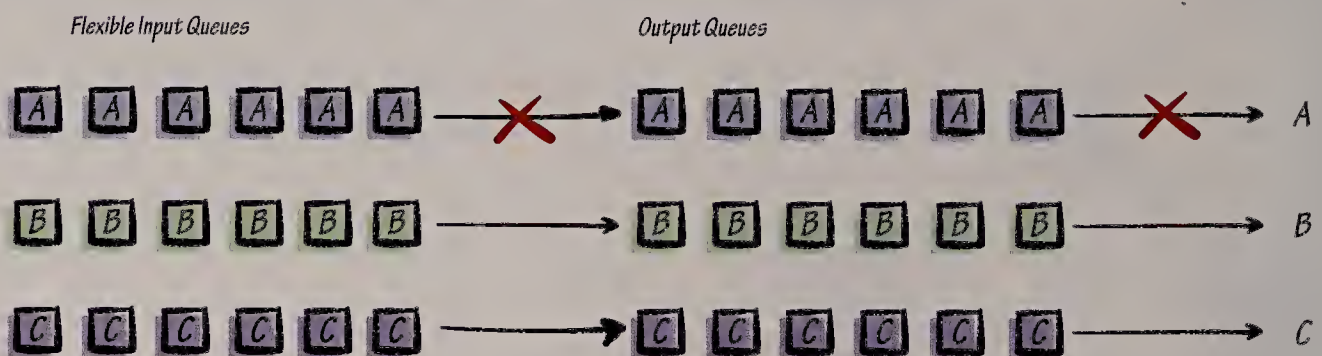
switching power is always proportional to the number of ports: each time a module is added, more switching power is added. The failure of a switching module impacts only that module. And non-switching functions that are centralized, such as network management, can easily be made redundant.

An ATM switch can experience two types of blocking: fabric blocking and head-of-line blocking.

1. Fabric blocking occurs when a switch's fabric capacity is less than the sum of its inputs. If so, it's possible for the switch, even when it's lightly loaded, to drop cells. It's more difficult to build a really fast fabric, so most ATM switches are limited to 16 or 32 OC-3c / STM-1 ports.
2. Head-of-line blocking presents a more subtle problem. It occurs when the queuing structure in the switch is simplistic; generally, that means a



Head of Line Blocking—A single congested output can block all traffic at an input port



Dedicated Queues by Output Port & QoS Type—Congested output blocks only cells destined for it

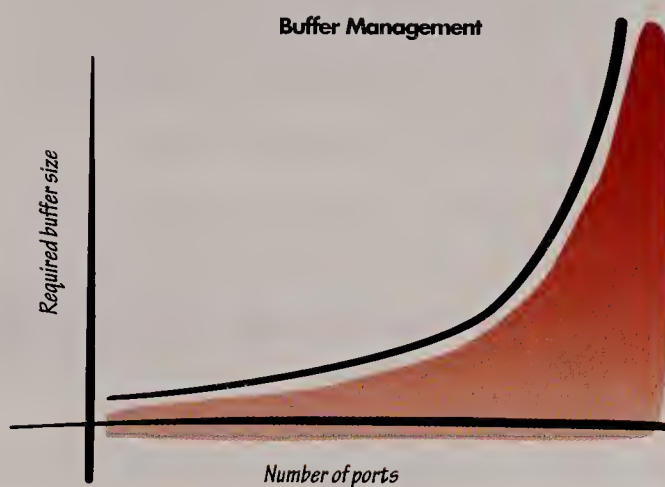
single queue in each input port. Imagine such a switch, in which an output on one port is congested, and a cell is sitting at the head of an input queue on another port waiting for that output. All of the cells sitting behind it will also have to wait—even if they're destined for other outputs. Or even if the cells behind it are CBR or VBR cells, which are supposed to have guaranteed priority.

To prevent head-of-line blocking, each input port in the switch should arrange traffic in multiple queues, one for each combination of output port and class of service. Xylan's X-Cell™ dynamically creates up to 2,304 queues at each input port. That's enough to support six classes of service for each of up to 384 output ports.

Buffer management is critical to effective throughput.

Sometimes a switch has to buffer data. A number of inputs might want to talk to one output at the same time; for example, several workstations simultaneously sending files to a server, or traffic from several floors sending at the same time to an inter-switch trunk port. Or an input might send data to a slower output port. For example, an OC-12c / STM-4c (622 Mbps) trunk port might send to an OC-3c /

FEATURE	Xylan OMNI-9	3Com 7000HD	Bay Centillion	Cisco LS1010	Fore ASX-1000
FABRIC RATE	13.2 Gbps	5 Gbps	3.2 Gbps	5 Gbps	10 Gbps
FABRIC TYPE	Distributed matrix	Centralized	Centralized for intermodule connections	Centralized	Four 2.5 Gbps sections, each centralized



STM-1 (155 Mbps) LAN switch. In either case, information is momentarily coming in faster than it can go out.

There are only three options in this situation.

1. The switch can flow-control the inputs, telling them to slow down—but today you can't flow control a LAN-based device. And even when a

workstation or server has an ATM NIC, throughput will be greater when flow-control is used as little as possible.

2. The switch can throw away some cells. This is not ideal.
3. Or the switch can buffer the cells, and send them out as quickly as possible.

Obviously, it's better to buffer the cells. But not all buffering mechanisms are equally effective.

Most ATM switches use output buffering. That's a pretty simple process, and it works fairly well in a small switch with all the ports operating at the same rate. Each port has an output buffer, hopefully large enough to handle any burst it's likely to receive. But as the switch gets larger, and as ports operating at different rates need to talk to each other, the output buffers need to get larger and larger. After a while it's just too expensive to provide enough buffer, and the switch has to lower the level of service it provides.

An alternative is DIBOC™ (distributed input buffering with output control). This new technique buffers at each input; the inputs "talk" with the outputs; and cells are sent across the switch fabric only when output bandwidth is available to transmit them. DIBOC™ is especially useful in bursty applications—such as moving LAN-based traffic across an ATM backbone.

But effective buffering techniques are not enough. The switch also needs enough buffers to be able to support large bursts of traffic. Imagine, for example, that AC power is lost in a building for a few minutes. When power comes back, all of the workstation connections are reestablished, and a big traffic surge hits the backbone. A single OC-3c / STM-1 connection can send one cell every 2.7 microseconds, or

3,700 cells in 1/100th of a second. A switch with 64 OC-3c / STM-1 ports bursting at the same time can receive over 2,360,000 cells in one tenth of a second.

FEATURE	Xylan OMNI-9	3Com 7000HD	Bay Centillion	Cisco LS1010	Fore ASX-1000
BUFFER TYPE	DIBOC™	Output buffering with output control	Output buffering with output control	Shared memory buffering with output control	Output buffering with output control
MAXIMUM CELL BUFFERS/SWITCH	2,097,152	19,200	24,000	65,536	212,992

Sometimes, cells must be discarded. It needs to be done intelligently.

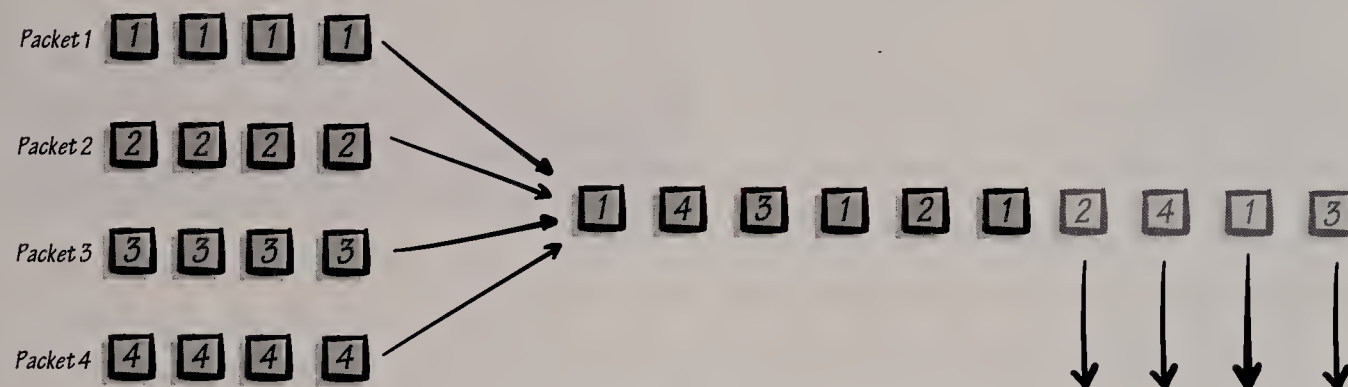
Even with very advanced buffer management, and even with very large buffers, it's still possible that occasionally, under heavy load, a switch may have to discard some cells. Intelligent cell discard is critical at these moments.

Remember that workstations and servers send packets. Each packet turns into a number of cells. When a switch is overloaded and discards a single cell, all of the cells in the now-damaged packet will need to be resent by the workstation. And it's often worse than that—layer-four protocols

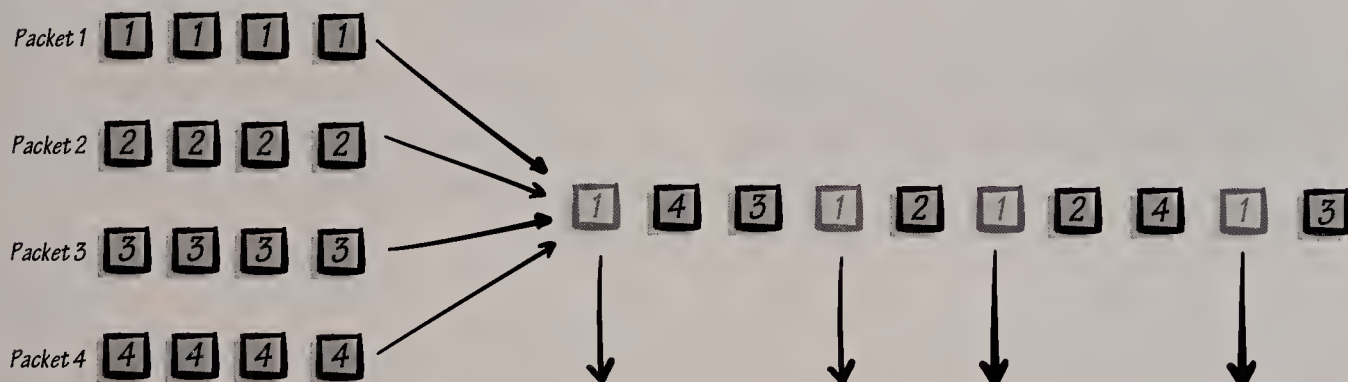
like TCP will also resend all the packets that came after the damaged one. As a result, discarding 100 cells at random can easily result in an additional load of thousands of cells. This is hardly a good solution.

What the switch needs to do is to intelligently discard cells from as few sessions as possible. EPD and PPD (Early Packet Discard and Partial Packet Discard) do exactly that. When there's excessive congestion, they use header information to locate cell "trains" (a cell train is a sequence of cells that originated as a packet). A cell train that's already entered the buffer is allowed to complete. New trains of cells are prevented from filling an already-congested buffer. EPD and PPD can dramatically improve frame-level throughput.

An advanced technique is known as RED (Random Early Detect). RED allows a switch to invoke PPD/EPD in a round-robin fashion, across all connections destined for a congested output port. This desynchronizes retransmission



Random Cell Discard—All stations re-transmit all cells



Intelligent Cell Discard—Only one station must re-transmit

timers in layer four protocols, thus dampening waves of retransmissions. RED can significantly improve overall network throughput.

And Xylan's X-Cell™ provides something more: up to 16 connection priority levels within each class of service, by virtual circuit or virtual path. So that, for example, network management traffic can always get through.

FEATURE	Xylan OMNI-9	3Com 7000HD	Bay Centillion	Cisco LS1010	Fore ASX-1000
PPD	Yes	No	No	Yes	Yes
EPD	Yes	No	Yes	Yes	Yes
RED	Yes	No	No	No	No
PRIORITY BY USER	Yes	No	No	Yes	Yes

An ATM switch should support a variety of traffic types.

ATM was designed to be able to carry very different kinds of traffic—for example, data, voice, and video—on a single network. This is one of the best reasons to use an ATM backbone. Each traffic type needs a distinctive set of characteristics, such as maximum delay, delay variation, timing, congestion control, and so on. Optimally, an ATM switch supports all of the important QoS (quality of service) types. Oddly, most don't.

Xylan's OmniSwitch with X-Cell™ supports all important classes of service, and prioritizes them.

1. CBR (constant bit rate) with primary reference source. A primary reference source allows CBR interfaces to be locked to a high-quality clock, such as that provided by a carrier.
2. CBR (constant bit rate). Constant bit rate traffic is also called "circuit emulation". It provides the same kind of service as a traditional leased-line circuit, or a channel on a time division multiplexer.
3. Rt-VBR (real-time variable bit rate). A good example of this service is packetized, compressed audio/video teleconferencing and multimedia.

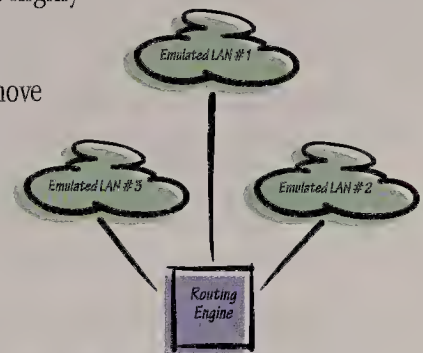
4. Nrt-VBR (non-real-time variable bit rate). This is similar to the connection-oriented service provided by a frame relay network.
5. ABR (available bit rate). This supports connectionless protocols such as IP, IPX, and AppleTalk, when the end stations are equipped with ATM NICs. The critical difference between ABR and UBR is that ABR supports congestion control.
6. UBR (unspecified bit rate). Most of the workstations connected to a typical ATM backbone won't have ATM NICs. Instead, they'll connect to LAN switches with ATM uplinks, or to multi-layer LAN/ATM switches (for example, Xylan's OmniSwitch). The service they're provided is UBR.

A switch should have, at each port, a dedicated queue for each class of service it supports.

FEATURE	Xylan OMNI-9	3Com 7000HD	Bay Centillion	Cisco LS1010	Fore ASX-1000
#OF QUEUE PRIORITY LEVELS	6 (CBR with PRS, CBR, rt- VBR, nrt-VBR, ABR, UBR)	2 (high and low)	2 (high and low)	4 (CBR, VBR, ABR, UBR)	3 (CBR, VBR, UBR)

Routing is an important complement to ATM switching.

Some people believe that ATM switching will eventually replace routing. But until protocol stacks like TCP/IP and NetWare evolve beyond their current form, the two functions will be closely intertwined. ATM, using LAN Emulation, provides a highly effective, well-defined, standardized way to move information within a broadcast domain. Routing provides a highly effective, well-defined, standardized way to move information between broadcast domains.



Integrated Routing—High speed, hardware-based routing engine moves data between emulated LANs

Many ATM switches do not support routing. Generally, an additional, separate router is needed.

FEATURE	Xylan OMNI-9	3Com 7000HD	Bay Centillion	Cisco LS1010	Fore ASX-1000
INTEGRATED IP AND IPX ROUTING	Yes	No	No	No	No

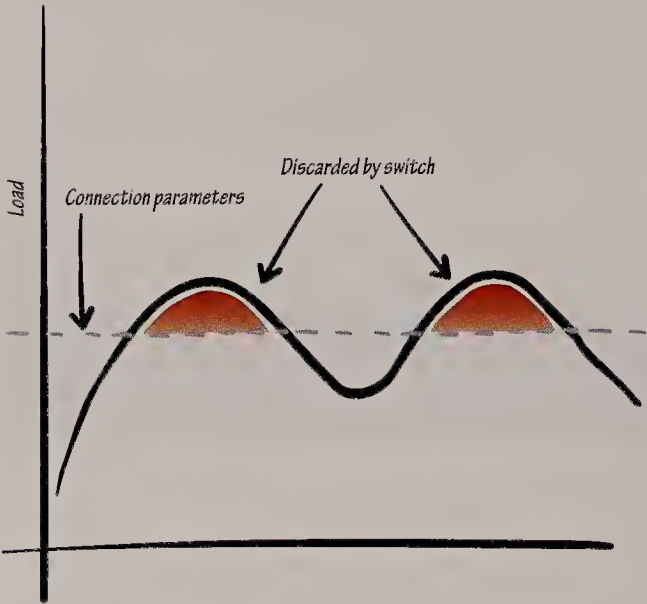
High throughput requires sophisticated traffic management.

Just as buffer management controls the movement of data within an ATM switch, traffic management controls the movement of data between an ATM switch and an attached device—especially when the switch is under heavy load. There are two kinds of traffic management: preventive and reactive.

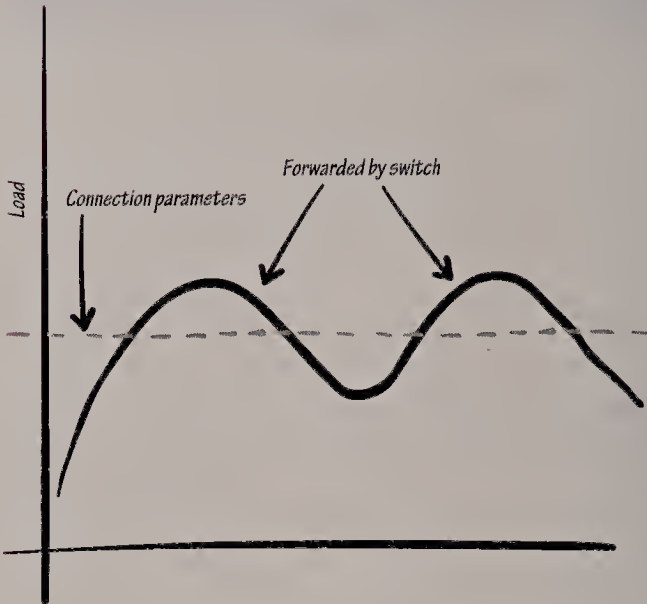
- 1. Dual GCRA (Dual Generic Cell Rate Algorithms, or “leaky buckets”) are a standard form of preventive traffic management. GCRA on each virtual circuit can police (enforce) the various rate parameters: peak cell rate, maximum burst size, and sustained cell rate. There are two kinds

of GCRA enforcement: static and congestion-based. Static-based enforcement will throw away cells on a connection (either a virtual path or a virtual channel) if they exceed the parameters—even if the switch is almost completely empty. Congestion-based traffic management is much more sophisticated. It looks at the input buffer and the output buffer; if they’re not congested, then it allows the excess traffic to pass.

- 2. ABR (available bit rate), like UBR, was defined to support bursty LAN traffic; its goal is to allow users to share the available bandwidth in the network. To do this, ABR provides two features that UBR does not. Users can specify a minimum cell rate for guaranteed throughput (no delay guarantees, though). And the user and switch can each regulate the rate at which they receive data from the other, depending on congestion in the network. This is called rate-based flow control; it’s a form of reactive traffic management.



Non-congestion-based—Cells exceeding parameters discarded, even though switch is lightly loaded



Congestion-based—Congestion-based traffic management optimizes throughput

Explicit rate processing is the most sophisticated method of rate-based flow control. It provides users with instantaneous information about the availability of bandwidth along logical connections. "RM" cells contain an explicit rate field; it tells users the maximum current rate at which they can transmit. This rapid-response capability provides higher throughput and better link utilization.

Some of these capabilities will need the latest version of UNI (UNI 4.0), so that the workstations and the switch can signal each other. But if the switch's basic architecture can't support them, just adding UNI 4.0 won't do the job.

FEATURE	Xylan OMNI-9	3Com 7000HD	Bay Centillion	Cisco LS1010	Fore ASX-1000
CONGESTION-BASED GCRA's	Yes	No	No	No	No
EXPLICIT RATE FLOW CONTROL	Yes	No	No	No	No

ATM is based on standards.

In the past, people sometimes said that the ATM standards were not yet complete, or that they were not widely implemented. Obviously, at some point that was correct. But today a broad set of standards is complete—UNI, TM 4.0 (Traffic Management 4.0), PNNI, Ethernet LAN Emulation, Token Ring LAN Emulation, physical layer-standards, and a variety of others. Eventually, all ATM switches will support these standards. But not all switches have implemented them yet. UNI defines how a workstation or a LAN switch "talks" to an ATM switch.

TM 4.0 provides the various rate-control mechanisms discussed above. It's critical to achieving optimal performance for workstations and servers with ATM NICs. PNNI is a way for switches to talk to each other so that connections can be set up across a network. It allows traffic to be load-balanced, not just between two switches, but across the entire switch fabric. And it can automatically and rapidly route around the failure of a cable, a switch port, or an entire switch.

FEATURE	Xylan OMNI-9	3Com 7000HD	Bay Centillion	Cisco LS1010	Fore ASX-1000
UNI 3.0	Yes	Yes	Yes	Yes	Yes
UNI 3.1	Yes	Yes	Yes	Yes	Yes
TM 4.0	Yes	No	No	Yes	No
PNNI	Yes	No	No	Yes	Yes
ETHERNET LANE	Yes	Yes	Yes	Yes	Yes
TOKEN RING LANE	Yes	No	Yes	No	No

A Challenge.

LANE (LAN Emulation) allows workstations and servers which use protocol stacks like TCP/IP and NetWare to talk to each other across an ATM network. It handles broadcasts, address translation, and so on. It's always easy to stay with the technologies and suppliers that you already have in place. But networking moves ahead rapidly, and market leaders aren't always the best choice for today... and for tomorrow.

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- Xylan's OmniSwitch has the best virtual LAN technology in the world.
- Xylan's OmniSwitch has the best security technology of any switch in the world.
- Xylan's OmniSwitch has the best wide area access of any switch in the world.
- Xylan's OmniSwitch has the most integrated LAN switching, ATM switching, routing, wide area access, and security technologies in the world.
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Client/Server Applications

Covering: Databases • Messaging • Groupware
Conferencing • Imaging • Multimedia • Development

Briefs

Information Advantage, of Minneapolis has updated its **DecisionSuite Server**, a tool set for building **online analytical processing (OLAP)** applications that work with various relational databases. Version 5.6 lets users create the OLAP reports they have created and then register the reports with various Web search engines. A second innovation lets users click on a Web page to trigger an OLAP report or analysis. The results are returned in HTML format. The software is priced starting at \$39,000.

© Information Advantage: (612) 820-0702

BEA Systems, Inc. of Sunnyvale, Calif., plans to ship the next version of its **message queuing middleware** by June. **MessageQ 4.0**, formerly a Dig-Equipment Corp. product, will include a publish/subscribe feature for broadcasting information to those applications that specifically request it.

Also new is a global naming service, which will let applications send and receive messages without having to know a remote user's location or identifier. The software runs on Windows NT, OpenVMS and all major Unix platforms. Pricing is based on the number of computers running MessageQ.

© BEA: (408) 743-4000

Qualcomm, Inc. of San Diego last week shipped **Eudora WorldMail** server, a standards-based Internet E-mail package designed for small to midsize businesses and departments. Running on Windows NT, WorldMail server supports Internet Message Access Protocol 4 and Post Office Protocol 3. While the server is available bundled with Eudora Pro client software, a stand-alone version costs from \$179 for a 10-mailbox license to \$1,875 for 500 mailboxes.

© Qualcomm: (619) 587-1121

Who needs to learn Java anyway?

EdgeworX set lets Visual Basic programmers build dynamic Web applications.

By John Cox
Dallas

Visual Basic (VB) developers do not need to be multilingual—in a computer programming sense—to write World-Wide Web applications.

At least that is the idea behind Antares Alliance Group's new EdgeworX programming tool set, which lets developers quickly build Web programs that execute application logic written in VB.

This means hundreds of thousands of programmers versed in VB or VB for Applications (VBA)—the latter of which is included in Microsoft Corp.'s Office97 and other applications—can rely on existing tools and skills to create dynamic Web pages. It

or clicks on a button in one of these forms, the Web server passes the data or event to the server-based EdgeworX run-time environment. The run-time activates the objects, runs the application and returns the results in HTML format via the Web server.

EdgeworX beta users reported they were able to create—in less than an hour—simple Web applications that triggered Excel spreadsheet calculations and database processing. More complex applications took a few hours.

Overall, programmers had to know very little about HTML, which EdgeworX generates automatically.

"Before working with EdgeworX, we were building HTML

The managers can select and book the rooms via the browser.

Dave McCue, quality assurance manager at Summit Software Co., a Jamesville, N.Y., software vendor that licenses VBA for use in third-party shrink-wrapped applications, used EdgeworX to create an interactive expense report application in a few hours. The application calls for the end user to fill in a Web-based expense form. The EdgeworX application then sends the data to a ready-to-run Excel spreadsheet report on a server. Excel calculates the expenses and returns results to the end user.

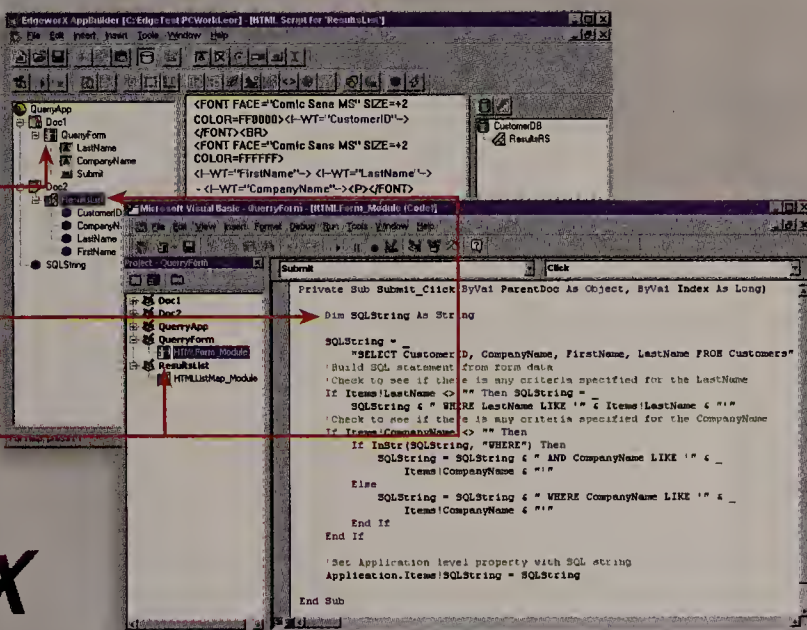
"I haven't seen anything else that comes close to EdgeworX," McCue said. "With very little

EDGEWORX: VISUAL BASIC FOR WEB APPLICATIONS

Antares Alliance Group's EdgeworX provides developers with a set of Web application objects to which the developers can add business logic using Visual Basic 5.0.

1. The developer lays out EdgeworX objects, including a Submit button in the QueryForm.
2. The developer invokes Visual Basic to create a SQL query for the Submit button.
3. The ResultsList object renders the data retrieved from the SQL query in HTML format.

EdgeworX



also prevents these developers from having to learn Java. EdgeworX features 27 reusable application objects, such as a text box and database access routine. Developers use mouse clicks to assemble an application from these objects, then employ VB or VBA to enhance the objects with additional logic, such as a specific SQL query to a given database.

The objects can be displayed as HTML forms via a Web server. When a browser user enters data

pages by hand and weren't able to link these with back-end data," said David Cain, president of WinWin Systems, Inc., a Web site developer based here. Cain has created a prototype application for a client that markets hotel accommodation services to auto racing teams that travel around the country. HTML pages let team accommodation managers log on to a server via a Web browser, type in a race event and dates, and see a database listing of available rooms and rates.

HTML knowledge, you can put together a robust Web site that actually does something. And you don't have to write [Common Gateway Interface] scripts."

Because it includes VBA, EdgeworX also comes with the VB code debugger. This means developers can run the applications they have built and test the code line by line, without having to deploy the applications on a Web server.

EdgeworX runs on Windows

NT 4.0 and Windows 95, and works with any Web server via the CGI, Microsoft's Internet Server API or the Netscape API. The Developer Edition is priced at \$399 per user.

©Antares: (800) 416-2888

www.nwfusion.com

Get more online:

- An evaluation copy of EdgeworX
- A white paper on programmable client objects
- A Visual Basic Applications FAQ

NetworkWorld
Fusion

Start-up looks to lick stamp challenge

By Paul McNamara
Palo Alto, Calif.

One hundred fifty years after the first U.S. stamp was applied, a California start-up is looking to put its mark on the \$56-billion-a-year postage market by delivering electronic stamps to businesses via the World-Wide Web.

"There aren't many human business applications that haven't been automated by software," said Sunir Kapoor, president of E-Stamp Corp., based here. "Postage is about the last, most mundane and ubiquitous of these office activities."

E-Stamp is a software and hardware offering that will allow a company to download postage value from a Web site, store it on a PC and print it onto outgoing mail as a bar-code-like marking. It should not be confused with E-mail.

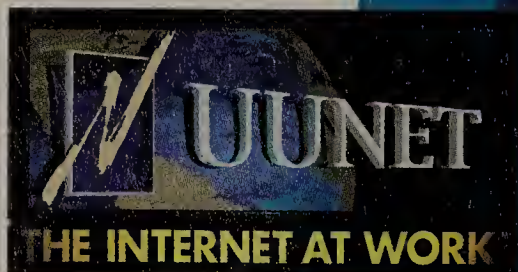
The U.S. Postal Service is reviewing the E-Stamp product's built-in security features and should reveal soon whether it will approve the technology's use, Kapoor said. Presuming permission is granted, E-Stamp will compete with Pitney Bowes—long the dominant mechanical postage-meter maker—in this new electronic postage market.

See E-Stamp, page 53

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Thin clients

New Moon rises to turn Windows PCs into network computers

By John Cox

Santa Clara, Calif.

A new software package has been designed to quickly convert a Windows PC into a network computer, without changing any application or operating system software.

New Moon Software, Inc.'s Liftoff package consists of server and client code.

The server software sits between a server-based 32-bit Windows application and Windows NT. When the application calls the operating system, Liftoff directs the call to NT Server or a remote PC running the client portion of Liftoff and either NT Workstation or Windows 95.

This approach lets MIS groups shift applications to powerful NT servers, on which the software can be installed and maintained more easily than on hundreds of separate clients, said Frank Mara, vice president of marketing. With Liftoff, heavy computational work is handled by NT Server, while the client operating system handles processing of graphical elements.

READY FOR LIFTOFF?

New Moon Software says its Liftoff package provides the following benefits:

- ▶ Simplifies management by moving applications from distributed Windows PCs to centralized Windows NT servers.
- ▶ Frees up client machine processing power.
- ▶ Preserves companies' Windows investments.
- ▶ Ensures that Windows 95 and NT clients as well as Windows NT servers handle appropriate processing chores.

"Neither the user nor the client PC needs to know where the application is running," Mara said.

The Liftoff software installs in a matter of minutes, according to the vendor. The server code runs as an NT service and makes use of NT features such as security and network connections. The client code takes up just 250K bytes of space. The client and server components communicate via New Moon's proprietary network protocol, though, the software runs over TCP/IP and SPX/IPX nets.

A graphical application lets systems administrators configure Liftoff to define user access rights to applications. Users can access multiple servers and applications, as well as cut and paste applications.

Rival products — most of which are based on Citrix Systems, Inc.'s multiuser version of NT — also create a Windows application server that can be accessed by remote PCs. But unlike the others, New Moon runs on standard NT.

Another difference is that New Moon works with Windows APIs instead of the lower level device drivers. This allows for more efficient net communications in that Liftoff sends only a menu operation

or other user interaction command to the remote PC, where the command is executed by Windows. By contrast, the Citrix model executes the same command on

the server and sends over the network all of the graphical displays and bitmaps to the client over the network.

Liftoff will be available June 15. It will

cost \$4,995 for 10 concurrent users and \$995 for each additional five-user license.

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E-Stamp

Continued from page 49

There is a huge pie to go after: Stamps alone account for \$12 billion of the total postage market's revenue.

Kapoor believes the cost of using E-Stamp technology will be less than half that of using a Pitney Bowes mechanical postage meter.

Designed initially for small office/home office use, the E-Stamp software will run on Microsoft Corp.'s Windows 95 and Windows NT operating systems.

The software interacts with a custom silicon chip called the E-Stamp Intelligent Button, which is the diameter of a dime

and three times the thickness. This chip sits inside a 2 1/2-inch square adapter that plugs into the printer port.

Using 1,024-bit key encryption, a customer would access E-Stamp's secure Web site, which is dubbed Internet Post Office.

Then the customer would designate a method of payment and download postage value into its E-Stamp button.

The stamp can be applied by printer to adhesive stickers or envelopes. Customers can even put the stamp directly onto a document that would then be placed inside a special envelope that displays the marking through a window in the upper right-hand corner.

At least one analyst contended that E-Stamp, whose key executives came from

Microsoft and Oracle Corp., has the right technology at the right time.

"They have a real shot at penetrating this marketplace, and for a start-up, it's certainly a lucrative position to be in," said Sam Albert, president of Sam Albert Associates, a Scarsdale, N.Y.-based consultancy.

© E-Stamp: (415) 843-8000

PROFILE: E-STAMP CORP.

Based: Palo Alto, Calif.

Management: CEO Salim Kara; President and COO Sunir Kapoor, previously vice president of planning and marketing at Oracle

Financials: Privately held **STAMP**

Products: E-Stamp, the first electronic stamp; E-Fill, Electronic Postage-on-Demand

BusinessBriefs

Fabrik Communications, Inc., in San Francisco, next month will begin including **virus scanning** capabilities from Santa Clara, Calif.-based **McAfee** in The Fabrik Service, an Internet E-mail service.

E-mail attachments sent to Fabrik customers will be checked using the technology within McAfee's VirusScan for Windows NT software.

© Fabrik: (800) 732-2745

Test equipment company **Teradyne, Inc.** has announced plans to buy **Softbridge, Inc.**, a Cambridge, Mass., vendor of tools for testing client/server business applications.

Softbridge, which markets the Automated Test Facility suite, will operate as a wholly owned Teradyne subsidiary. The companies refused to disclose financial terms of the acquisition.

Arbor Software Corp., in Sunnyvale, Calif., reported record results for its fourth quarter ended March 31.

Revenue was up 80% to \$14.8 million from \$8.2 million in the fourth quarter a year ago; earnings rose 22% to \$1.7 million from \$1.4 million in the same period last year. The company's annual revenue jumped 89% to \$47.4 million, while earnings for the year doubled from \$2.9 million to \$5.8 million.

The company sells Essbase, a multi-dimensional database used for online analytical processing.

Does managing your TCP/IP Name Space seem like a monumental task?

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Meta IP has been designed to fit your specific IP management needs. Customize your solution by choosing Meta IP or any of its components, including Meta IP/DNS, Meta IP/DHCP or the Meta IP/Manager. Instantaneously integrate all platforms that combine standards-based technologies with a centralized administration service. It's the ideal framework for managing the TCP/IP configuration of your entire LAN.

And, since the Meta IP interface is Java-based, you can simply run it on any platform. In fact, by using the Meta IP/Manager you can easily communicate with any UNIX-based DNS. The Meta IP/Manager maintains all of the existing information for your primary and secondary servers. Which means your data's integrity is guaranteed and your life just got easier.

Meta IP is available for Windows NT 3.51 or 4.0 on the Intel and Alpha platforms. For a free download, or to find out about all the ways MetaInfo is bringing Internet technologies to NT, visit our Web site or call 206.674.3892.

www.metainfo.com

metainfo

Meta IP

The year of videoconferencing is here . . . no, really

Market momentum has many drivers, though many obstacles remain.

By Paul McNamara

This is the year videoconferencing will come of age, the experts say.

Of course, they said the same thing last year, and the year before that, and, well, just about every year since that legendary videophone demonstration at the 1964 World's Fair.

This time, however, the optimistic prognosticators just might be right. A variety of developments — maturing standards and plummeting prices, in particular — are converging to propel sales to record heights. Last year, about 300,000 business desktop systems and 25,000 room systems were shipped, according to industry watcher Elliot Gold, president of Telespan Publishing Corp. in Altadena, Calif.

All this is not to say videoconferencing has finally gone mainstream. Scaling that peak, industry watchers say, will depend on a number of factors. Here are some of the big ones that will speed up or slow down this market's momentum.

and data over TCP/IP, Ethernet LANs and the Internet (H.323) as well as analog phone lines (H.324). These and other standards are expected to generate demand for room and desktop products that conform to them.

One H.323-compliant offering, Version 2.0 of Microsoft Corp.'s free NetMeeting software, was released last week. NetMeeting, which is a video, audio, telephony and data conferencing package, has been downloaded to 4 million desktops since its debut in late 1995, the company claims.

● With room systems such as PictureTel Corp.'s SwiftSite now available for less than \$10,000, and desktop videoconferencing software such as NetMeeting being given away, the industry may be on the verge of vanquishing one of its most daunting obstacles: cost.

"Most people have it in their mind that videoconferencing is an executive toy that costs \$40,000 per room," says Jack O'Neil, vice president of marketing at videoconferencing prod-

be the center of the universe, that's what Microsoft wants," O'Neil says. "Whatever it takes to get you to upgrade to the latest Pentium, that's what Intel wants."

● Success stories are beginning to accumulate: Witness Ralph Ungermann, president and CEO of First Virtual Corp., a Santa Clara, Calif., multimedia network product vendor. Here's an executive who says he hadn't taken a business trip in seven months, thanks to videoconferencing, and only broke that string last week because the client in question does business in China, where the technology has yet to take hold.

● Companies are pumping money into higher speed LAN technologies that are well suited to handle video traffic.

"One of the things we found in our survey is that 100M/155M bit/sec ATM will feature the greatest new growth in organizations deploying desktop videoconferencing," says Jeannine Linehan, a project manager at Sage Research, Inc. in Natick,

Market inhibitors

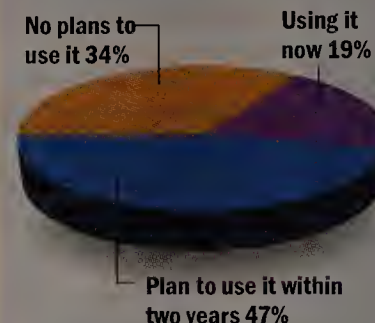
● The surface allure of standards-based videoconferencing may prove unsatisfying as customers experience the "lowest common denominator" effect of mixing and matching brands. Also, standards-based technology doesn't necessarily assure interoperability, given that different vendors interpret specifications differently.

● Long-distance telephone giants are not doing enough to facilitate multipoint videoconferencing, according to customers.

"The biggest issue we have is proprietary dial plans are put in place by Sprint [Corp.], MCI [Communications Corp.] and AT&T," says Bill Muller, videoconferencing manager for professional services firm Ernst & Young, LLP in Lyndhurst, N.J. "They need to integrate those video dial plans so that if I'm on AT&T switched I can call directly to Sprint or MCI switched. I shouldn't have to go through the inconvenience of putting in their long-distance personal identification code number."

● Videoconferencing re-

WHAT ARE YOUR DESKTOP VIDEOCONFERENCING PLANS?



Based on a survey of 270 companies.

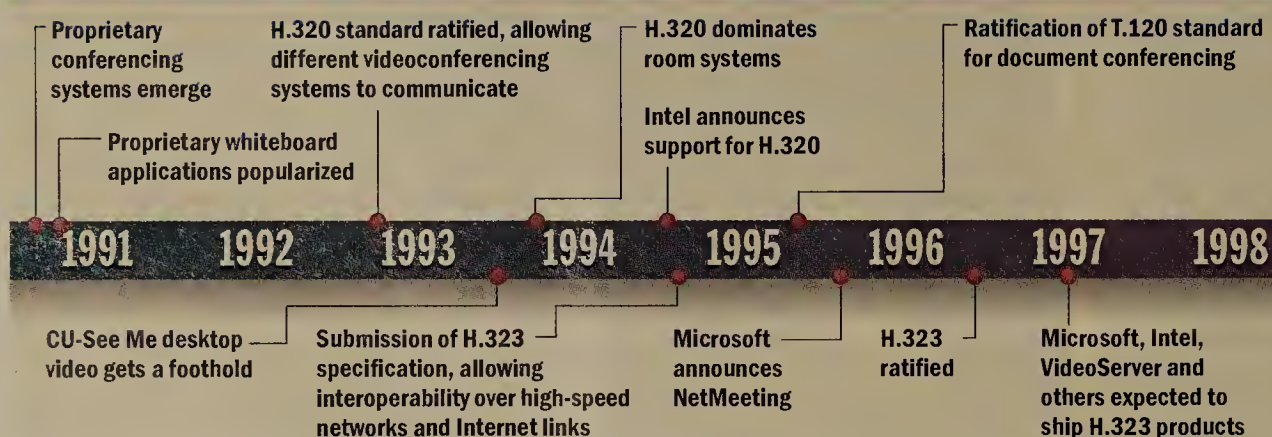
SOURCE: SAGE RESEARCH, NATICK, MASS.

mains a bandwidth hog, with 80% of WAN hookups conducted over costly, oftentimes hard-to-acquire ISDN lines.

Vendors say the problem is overrated and bound to evaporate over time as video becomes a more popular LAN application and LAN infrastructures are upgraded.

● Even the best desktop videoconferencing picture will not be mistaken for your living room TV set, unless you're willing to pay for a Primary Rate Interface ISDN line. "If you run at 128K [bit/sec], which is an ISDN Basic Rate Interface, you have a much more manageable phone bill," O'Neil says. "But the picture is nowhere near as good [as with PRI]." ■

Videoconferencing over time



Market drivers

● Standards, standards and more standards. Nearly 40 vendors from 12 countries gathered in Berlin last week to demonstrate interoperability of their standards-based products at the International Multimedia Teleconferencing Consortium's SuperOp 97 event.

The newest standards — adopted last year by the International Telecommunication Union — lay down the law for transmitting audio, video

uct maker VideoServer, Inc. in Burlington, Mass. "The reality is that this year videoconferencing becomes something that you can add to a state-of-the-art PC for \$200 [the cost of a camera]."

● Some observers say desktop video is destined for mega-success because industry behemoths such as Microsoft and Intel Corp. (with its MMX processor technology and popular ProShare videoconferencing system) have decreed it to be so. "Whatever it takes to have the PC

Mass. "It's indicative of video driving the growth of ATM, and ATM helping or fueling the growth of video."

Those who remain skeptical about videoconferencing's future might want to consider The Generation Effect: "The PCs that are being shipped to the old farts are not going to be used for video," says Telespan's Gold. "But the younger generation will use [video] like they use chat. The more that it's shipped, the more it's going to be used."

Can you count on a videoconference?

It was only one demonstration of one multipoint videoconferencing room system conducted in front of an audience of exactly one: a reporter.

But the equipment simply would not work — not when it was supposed to, not even after 20 minutes of frantic resuscitation efforts by a handful of technicians at VideoServer, Inc.'s Burlington, Mass., headquarters.

Nothing works every time, but the question bears asking: Can corporations count on even the best videoconferencing equipment for that critical board meeting or coast-to-coast product introduction?

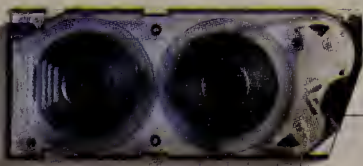
"We think it's reliable enough, but we don't kid ourselves or anybody else into thinking it is as reliable as it should be or certainly as reliable as we would like it to be," says Kevin Flanagan, a spokesman for PictureTel Corp., the company that had its nameplate on the VideoServer demonstration system.

What's "reliable enough" is a judgment call, of course. Executives mulling an investment in the technology often have reservations about its reliability, says Jim Idelson, president of Designet International, Inc., a consultancy in Sudbury, Mass.

So how often can you expect your videoconference to start on time and finish uninterrupted? "The high end of the spectrum is averaging 90-something percent success, but that's with a lot of [outside] support," Idelson says. Many companies are experiencing a considerably lower rate of success, primarily because of network vagaries and inadequate training, he says.

— Paul McNamara

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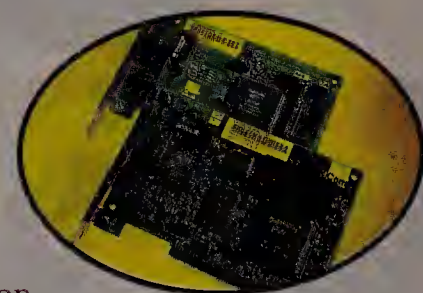
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Briefs

■ **Speedware Corp.** this week began shipping *Speedware OrderPoint*, a Web-based application for setting up inventory, ordering and **order processing** on the Internet. *OrderPoint* works with databases from Oracle Corp., Informix, Inc., Sybase, Inc. and SQL/Server, among others. It is available to run on Windows NT, Windows 95, HP-UX, as well as Sun Microsystems, Inc. and IBM Unix platforms.

© Speedware: (416) 408-2880

■ **Early this month Entrust Technologies, Inc.** plans to ship the *EntrustIPsec Negotiator Toolkit*, which can be used to develop IPsec-based applications for remote access, firewall, **single sign-on authentication**.

Entrust Technologies Chief Technology Officer John Ryan said he expected to see the toolkit used for electronic data interchange applications.

© Entrust Technologies:
(613) 763-9244

■ **TeleGrafix Communications, Inc.** has started shipping *RipTEL Visual Telnet*, a type of Internet browser software that lets Internet users explore **online bulletin board systems**. *TeleGrafix* expects to ship soon *RIPscrip* plug-ins for Netscape and Microsoft Web browsers that permit viewing of *RIPscrip* images embedded in Web pages.

© TeleGrafix Communications: (540) 678-4050

■ **Denver-based Astrobyte LLC** has released a public beta of *BeyondPress 3.0*, the third version of its **Web authoring** tool that lets designers create Web pages based on *Cascading Style Sheet* support. *BeyondPress* converts stylized text in a *QuarkXpress* document into formatted text on a Web page, retaining the intended fonts and type size, and using *HTML* tables to approximate the layout of a *QuarkXpress* page. Priced at \$495, the Macintosh version of the product will ship at the end of this month; the Windows version will be ready by midsummer.

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AT&T's Evslin takes on Internet issues

AT&T Internet chief gives with the strategy.

QA Tom Evslin has done it all — running a small start-up, overseeing Microsoft's messaging products. Now, as vice president of AT&T WorldNet Services, he is launching AT&T's business and consumer Internet services.

In an interview with *Network World* Senior Editor Ellen Messmer, the well-rounded three-year AT&T veteran described how telecommunications giant AT&T is adapting to the 'Net.

Since you joined AT&T [in 1994] to get its Internet service up and running, what are the major changes you've seen?

The WorldNet service has

been a way of deepening our relationship with our customers. For our business customers who were already into electronic commerce — when you think about 800 service — but ready to move to this new form of electronic commerce, we were able to deepen our relationship with them by complementing 800 services with Web hosting services, with connections to the Internet. For our consumer customers, it was actually the first step in moving beyond being just a long-distance company.

As deregulation goes along, we will provide local and long-distance service. We're doing that in selective markets already.

You have spoken of an innovative service that will allow you to click on a Web page and talk to an attendant. How does it work?

It's called Project iA. The commercial customer sets up a Web site hosted by AT&T, and on that Web site is a special button just like on any other URL. But [the button] goes to this intelligent processor in our network that hooks together the long-distance network and the Internet, essentially. So the customer sees this button that says 'talk to me' and then clicks on the button.

What actually happens is phone calls are placed out from the network to the owner of the Web page, the commercial establishment, and to the consumer.

Would you be doing IP voice then?

We'd be doing IP voice, not end to end initially but out to the consumer over that single telephone line.

Now what we're doing is using the Internet for control but not for carrying the voice.

As we go along, we'll carry voice on the Internet, as well.

It was thought that the traditional telephone carriers would be somewhat threatened by IP voice, but you seem to have a very upbeat attitude about it. Is your attitude ubiquitous at AT&T?

When [AT&T president] John Walter was speaking a couple of weeks ago at Esther Dyson's conference, he was asked a similar question. What John said was that if we were a telephone company, we'd be scared to death of this.

But we're not a telephone company; we're a communications company. So, for us, this is an opportunity.

Does it worry you that the local exchange carriers are now becoming involved in the Internet, so they're not only controlling the last mile to some extent but now they seem to be saying, 'We're going to be the Internet?'

Download the complete transcript of our interview with AT&T's Tom Evslin.



We're happy to compete with them. We expected to compete with them. We're surprised it took them so long to get into the business. However, right now, they're an obstacle to anybody providing very good Internet service. Their ability to provision phone lines is often a negating factor in being able to expand Internet access.

Do you see traditional services like X.25 being phased out in favor of the Internet? Is the Internet a replacement, or are

See Evslin, page 62



AT&T's Evslin

ThingMaker headlines Internet Showcase

By Chris Nerney
San Diego

A company begun by two former Lotus Development Corp. executives last week unveiled ThingMaker — Web-based multimedia authoring software that uses a drag-and-drop interface to create dynamic Web pages.



Parable LLC's ThingMaker allows users to easily select and move multimedia components while creating Web pages.

The announcement by Parable LLC of Cambridge, Mass., was one of dozens made here at Internet Showcase, a four-day event featuring 60 Internet start-up companies.

The showcase also served as Parable's official launch; the

company was formed last August by ex-Lotus executives Eric Bedell and Steve Barlow.

ThingMaker lets users easily build Web pages that contain multimedia components utilizing sound, images and animation, according to Bedell.

These components can be used individually or combined to create banner ads, navigation buttons, image maps and multimedia effects.

ThingMaker also includes tools that allow Web page creators to lock or protect the multimedia objects they make so they cannot be copied and used on other pages.

Conversely, another feature of ThingMaker permits the use of multimedia objects that include appended copyright information and biographical data about the object's author.

That way, every copy of a ThingMaker-created object can be tracked to its owner.

Internet Showcase organizer and industry pundit David Cour-

sey said, "[ThingMaker's] locking and copyright capabilities allow any Web publisher to receive the credit they deserve for their creations."

ThingMaker runs on Windows 95 and NT. It will be available for free download starting May 15 at www.thingworld.com or www.parablecorp.com.

Version 1.0 is expected to be available by the third quarter for less than \$100.

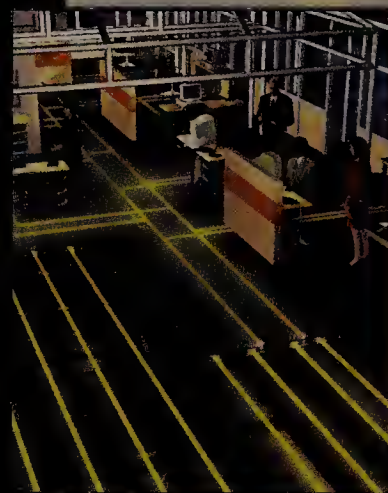
Other announcements made last week at Internet Showcase:

- emWare unveiled a "micro" Web server. This server is designed to let Internet surfers use their browsers to control electronic devices containing embedded software.

Company officials said Embedded Micro Interface Technology (EMIT) 1.0, based on Internet protocols and Java programming, can be used to manage devices such as cellular phones, cars, door locks, air-conditioning systems, medical instruments and copiers using a standard Web browser. Devices can be controlled over the Internet or through a direct connection.

See ThingMaker, page 62

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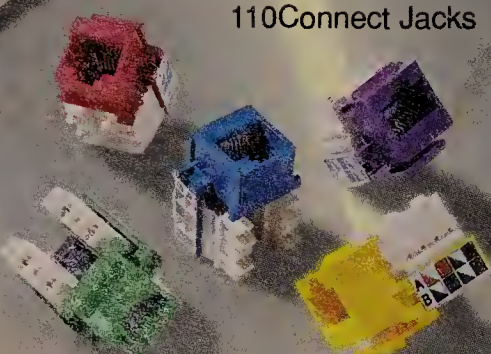
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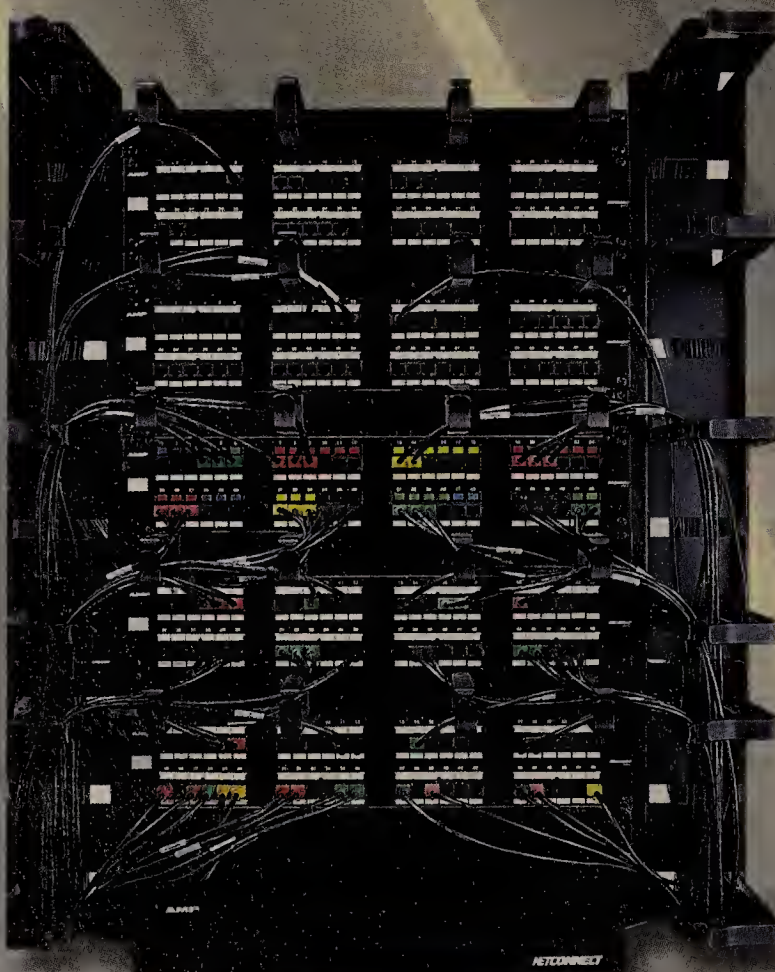
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Users say 'Net conferencing tool 'Meets' expectations

By Carol Sliwa

Redmond, Wash.

Microsoft Corp. last week began shipping the second version of its NetMeeting client software, featuring standards-based videoconferencing capabilities that could open the door for more interactive communication over the Internet.

Version 2.0 of NetMeeting adds support for the H.323 standard enabling audio and video over any packet-based network.

For Deere & Co., such standards support is important since the company's vision is to tie in the product with its existing standards-based group videoconferencing systems.

"Originally, we looked at using NetMeeting on the data side only, and we've been pleasantly surprised that the audio and video have come along as quickly as it has," said Carlo Pensyl, Internet technical project manager for the Moline, Ill.-based company.

With employees worldwide, Deere & Co. has sought out ways to allow employees to collaborate electronically. "When you're dealing with multiple cultures, the ability to interact on a synchronous basis is much better," Pensyl said. "It makes everybody more productive."

To date, Deere & Co. has only been exploring the possibility of using NetMeeting companywide. On a pilot basis, the agricultural/industrial equipment manufacturer has been using NetMeeting for its application-sharing capabilities to help with technical support in its rollout of Microsoft's Exchange Server E-mail product.

With NetMeeting, for instance, an IS manager in Illinois can view or literally take over the screen of an IS employee in Mexico or Germany to answer questions or solve a problem.

That application-sharing capability is also what drew FileNet Corp. to NetMeeting. The Costa Mesa, Calif., software maker has been using NetMeeting for demonstrating products and keeping its internal sales force up to date on products.

In the future, the company also plans to look into using NetMeeting to keep resellers informed and provide customer support, according to Jack Diamond, FileNet's national sales support manager.

"It has so many powerful ways of communicating. It brings a new perspective to the Internet," Diamond said.

"I think you'll see, as Internet pipes get faster and faster, the audio and video will come into play. You'll be able to really communicate with whoever's on the other end," he said.

NetMeeting 2.0 now works on Windows NT and Windows 95. Other new features include:

- An improved user interface, with a tabbed dialog bar down the left side of the screen that makes it easier for end users to move from function to function.

- Switchable audio and video, allowing users in a multipoint call to switch from one participant to another.

- System policy support, letting an IS manager control which end users can use the audio, video or application-

sharing capabilities.

- Dockable/undockable video windows that allow users to move the video screen so they can see other applications around it.

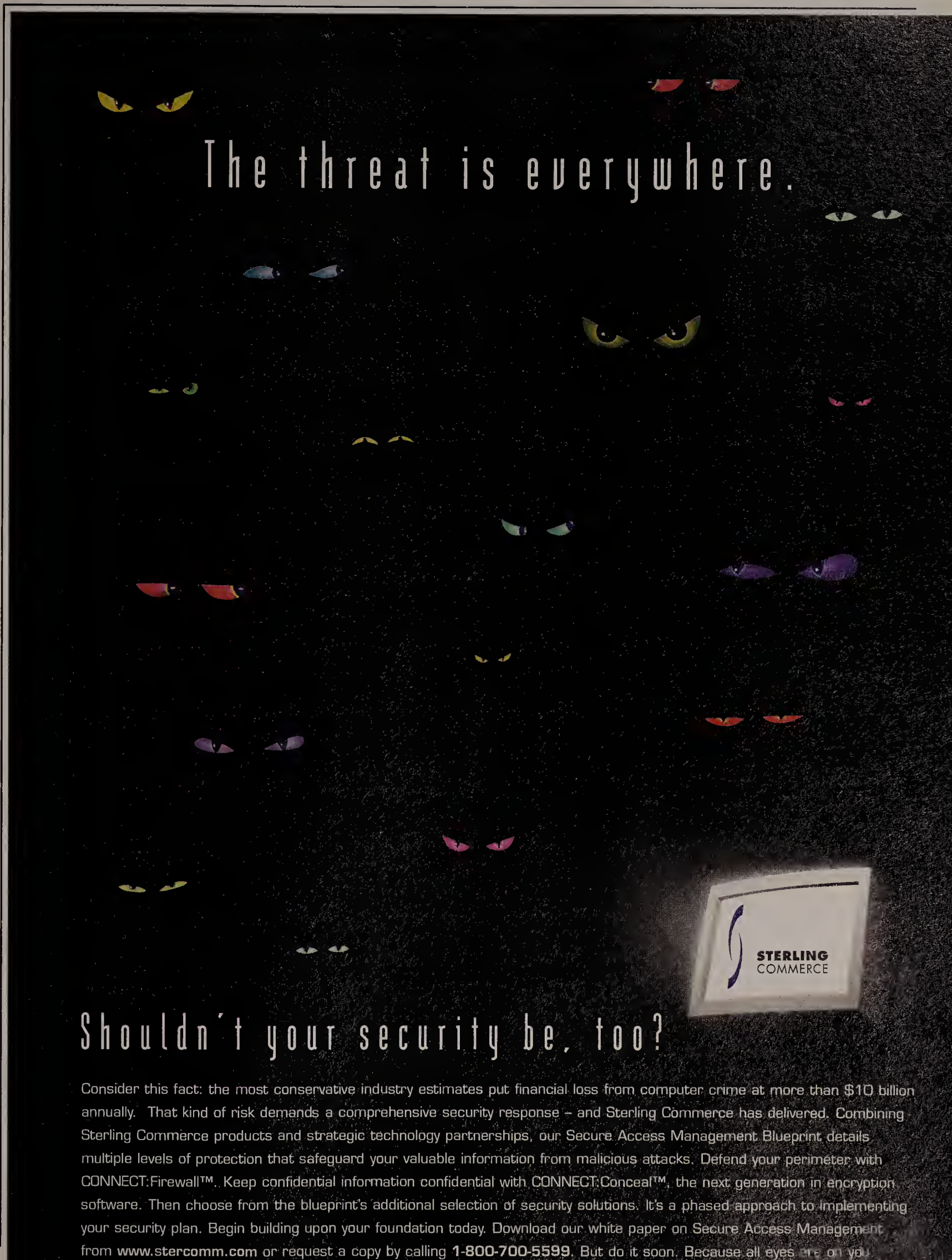
- Support for Intel's MMX multimedia

enhancing processor.

The final version of Microsoft's Internet Locator Server also is available for helping users identify and connect to other users online.

NetMeeting can be downloaded for free from Microsoft's Web site at www.microsoft.com/netmeeting/.

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'Net E-commerce sites face plenty of legal challenges

By Niall McKay

Electronic commerce vendors face a range of legal challenges if they fail to influence local lawmakers drafting rules for online transactions around the world,

according to a new report by Forrester Research, Inc. of Cambridge, Mass.

The report, "Law, Regulation, and the Internet," outlines five problem areas for organizations trying to conduct elec-

tronic commerce over the Internet. These include new tax traps, problems with international lawsuits, increased pressure from intellectual property organizations, clashes over free speech and privacy

rights, and uncertainty about the status of electronic contracts.

One main problem is that federal and local authorities worldwide believe they can judge a Web presence according to their laws. And they can bring lawsuits in their courts if they do not like what they see, the report says.

However, laws differ from country to country. For instance, Singapore imposes strict censorship on Internet content, the report states. Meanwhile, many countries around the world restrict cryptographic software, while others outlaw it. And Europe has far stricter intellectual property laws and consumer data protection laws than the U.S. In fact, the European Community is threatening to cut off U.S. access to European data in 1998 if the U.S. does not comply.

Many countries also are considering how to tax online transactions as they do transactions currently made through other means. Some are struggling to apply existing tax laws to electronic commerce, and others are thinking about drafting new laws. But this issue raises the question of which jurisdiction the taxes fall into — in the country hosting the Web server or in the country where the goods are sold.

The report also states that there are many new content licensing traps. For example, having print media rights to a photograph does not give automatic license to publish it electronically.

Unauthorized use of content is common, and trademarks and domain names collide frequently, the report says.

The report recommends a three-step approach to electronic commerce:

1. Companies should tackle markets incrementally and not try to do business throughout the whole world from the start. Many businesses, especially those in regulated industries such as insurance, securities and pharmaceuticals, must adapt content to local law.

2. Companies should be selective about their customers and publish globally while concentrating on selling to local markets. Companies should minimize risk of liability by refusing customers from locations where regulations would prohibit trading in that location.

3. Companies should distribute electronic commerce initiatives internationally by establishing a geographical presence in local markets and tailoring content to those markets.

The report also recommends companies be proactive about legislation and try to influence their lawmakers now, rather than react to unfair legislation after it is enacted.

The report advises governments to drop restrictions on strong encryption in the name of law enforcement and acknowledge that controlling 'Net access is futile.

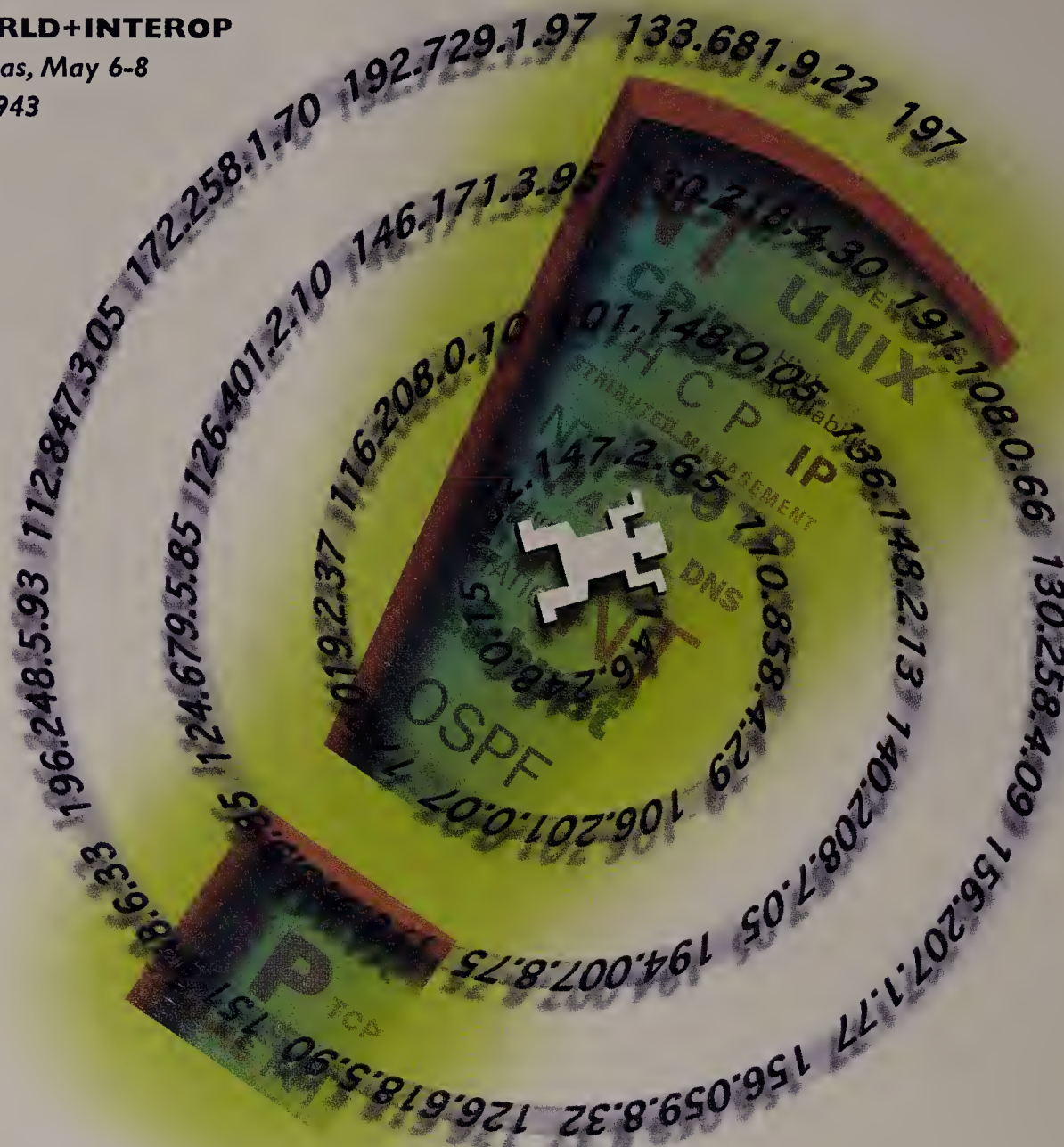
McKay is a correspondent with the IDG News Service in San Francisco.

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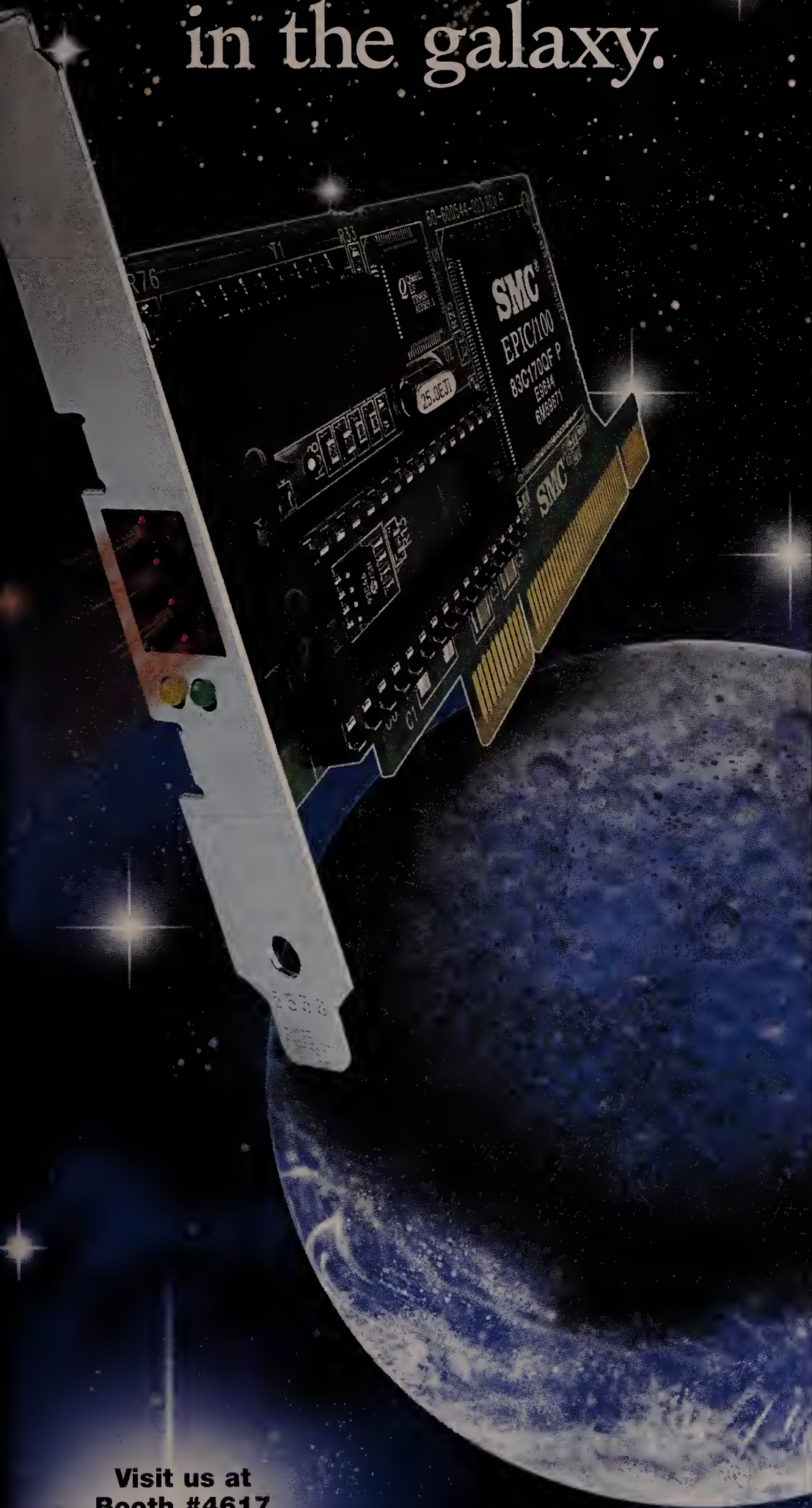
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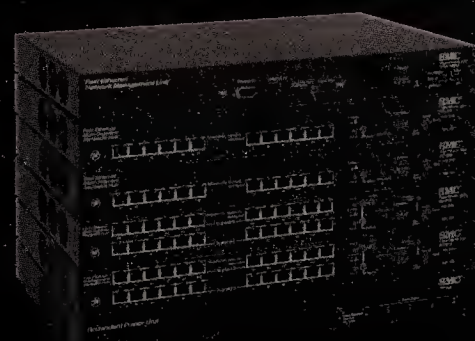
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ThingMaker

Continued from page 57

tion, such as dial-up and wireless.

The EMIT 1.0 Software Developers Kit is scheduled to be available May 15 starting at \$1,200 for 10 single-user licenses and \$3,000 for 10 corporate-site licenses.

Based in Midvale, Utah, emWare was cofounded by Chris Sontag, a former Novell, Inc. executive who worked in the company's recently disbanded embedded system technology division.

• Lanacom, Inc., a push technology start-up based in Toronto, unveiled software designed to deliver filtered news and information to users from the Internet

and internal sites, including corporate intranets, E-mail and databases.

Lanacom Headliner Professional is scheduled to be available by the end of the month for both individual and multiple users.

It runs on Windows 95 or NT 4.0 and requires a Web browser such as Microsoft Corp.'s Internet Explorer or Netscape

Communications Corp.'s Navigator. Pricing information was not available.

• An Austin, Texas-based start-up demonstrated Ding, a Java-based browser designed to let users know at a glance who is online. Ding allows users to communicate via E-mail or multiparty chat and file/URL transfer.

Activeverse, Inc. officials said Ding's distributed system architecture, which is primarily peer to peer, minimizes dependence on central servers, and thus avoids performance problems related to serverload.

A beta version of Ding is slated to be available this month. A release version priced at \$29.95 per user is scheduled for the summer.

A switchboard product that will allow organizations to set up internal Ding directories will be offered later this year. ■

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Evslin

Continued from page 57

customers buying Internet service on top of the old, traditional X.25 and direct data services?

Well, it's different for different services. Certainly, the Internet is a replacement for the X.25, and we find our customers moving as quickly as they can from X.25 to date-mode IP. We still support our X.25 customers, but there's no growth in that and there's a clear substitution.

Interestingly, when we went into frame relay, we thought that the demand for private lines would dry up quickly and people would go to making frame relay connections, rather than private lines.

Surprisingly, though, we grew very quickly to become the No. 1 supplier of frame relay, the private-line business has continued to grow.

Why is that, do you think?

What we think is happening is that the growth in data networking is so great that the applications that were on private lines are growing by themselves.

And in many cases, the value of the application is so much greater than what incremental costs you might be able to bring out if you reengineered to use frame.

There are companies considering dropping their private lines across the ocean in favor of the Internet. Do you see that happening a lot, or are you encouraging them to do that?

Our policy is to encourage them to do what's best for them, and even to be consultants to them in doing what's best for them.

So if we see that a frame connection or an IP connection is what's going to serve our customer best, we'll try to talk them into it, even if it means lowering some of the prices that they pay us. ■

TO COMPANIES
ADDING MORE
BACKBONE TO THEIR
NETWORK, MAY
WE SUGGEST
A BRAIN TO GO
WITH IT?



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'NET INSIDER

An Internet logic brownout

At about 11:30 a.m., Friday April 25, a "yet unexplained twist of bits" caused a router at MAI Network Services to send some incorrect routing informa-

tion into MAE-East, where it was picked up by Sprint Corp. and perhaps other major Internet service providers. The result was that Sprint thought MAI pro-

vided the best path to almost anywhere. Sprint routers announced the new better path to its ISP peers and started sending their traffic to MAI. What happened after 11:30 a.m. demonstrates some strengths and weaknesses of today's 'Net.

Through the use of good monitoring techniques, MAI quickly figured out that something was wrong. Their technical

people started working on the problem, and within 15 minutes shut down the routing connection to Sprint and called the company's network management staff. This should have ended the problem, but for some unknown reason, Sprint's router kept advertising the bad routing information — even though MAI was no longer sending the bad information to Sprint.

This persisted even after MAI turned off its router and Sprint turned off the DS-3 link to MAI, either of which should have fixed the problem. The problems died out eventually, in most places within an hour or so, but persisted in a few spots for up to 7 1/2 hours.

The routing problems did cause, as one observer put it, an "Internet brown-out." Connectivity problems affected many Internet users. It was not that these users were cut off entirely, but many did experience problems reaching some sites. This was not any sort of catastrophic collapse, but it was a real problem.

The problem here was not the introduction of bad routing information, even though it should not have happened and it was the trigger for the problems that followed. The basic problem was not the interaction between the technical staffs at the various ISPs. MAI

and Sprint were on the phone soon after the events started and the technical people from many of the affected ISPs got on a conference call soon thereafter.

Instead, the basic problem seems to have been some bug or feature in the routing protocol that caused the bad information to continue distribution even after the source was removed. Bugs happen. This one soon will be found and fixed so that this specific problem will be less likely to occur in the future.

MAI's network management process and those for sharing information among the ISPs' technical staff worked very well.

However, the cognitive powers of some people did not fare as well. Some pundits on nanog, a North American Network Operators Group mailing list, seemed to see malfeasance and incompetence behind the episode. Some of the trade press could only see fragility in the structure, not acknowledge that the 'Net had survived yet another potentially major disruption with little visible effect. It is not an accident that the 'Net kept running. Its architecture, design of the protocols and cooperation among ISPs make it likely that, more often than not, this will be the normal outcome of such problems.

Disclaimer: There are at least four opinions for every three pundits at Harvard; this is one of them.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached via the Internet at sob@harvard.edu.



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Intranet

Extending your intranet

Thinking about taking the plunge into extranets and linking your intranet to trading partners? Here are the key issues to address. **Page 20.**

Also inside

- **SM's sticky business**
- Review: Folio's **siteDirector 3.1**
- The **mail integration** question
- **IntraNet/Ernst & Young** survey results
- Those thorny **management issues**



Inbox



Tasks



New Contact

Almy, Gretchen

E-mail: gretch@wk.com

Goodman, Jae

E-mail: jae@wk.com

Lilly, Kim

8^{am}

Conference
(My of)

9⁰⁰

Strategy
(Main

10⁰⁰

Present

11⁰⁰

Meeting
(5th flo

Microsoft Outlook 97/now/

organizational
through



Calendar



Contacts



Journal

call with Don

Meeting
conference room

on to client (

on John Rus
conference

From	Subject	Received
Christy Ruyle	RE: Friday presentations	Tue 3/11/97
Carrie Cameron	Friday Presentations....	Tue 3/11/97
Gretchen Almy	presentation time again	Tue 3/11/97
Fast breaking news: we're now presenting the current sales results one week earlier than anticipated. So, get out there and sell like you've never sold before. That is all.		
Christy Ruyle	RE: 2 things	Fri 3/7/97



On can run wild your company.

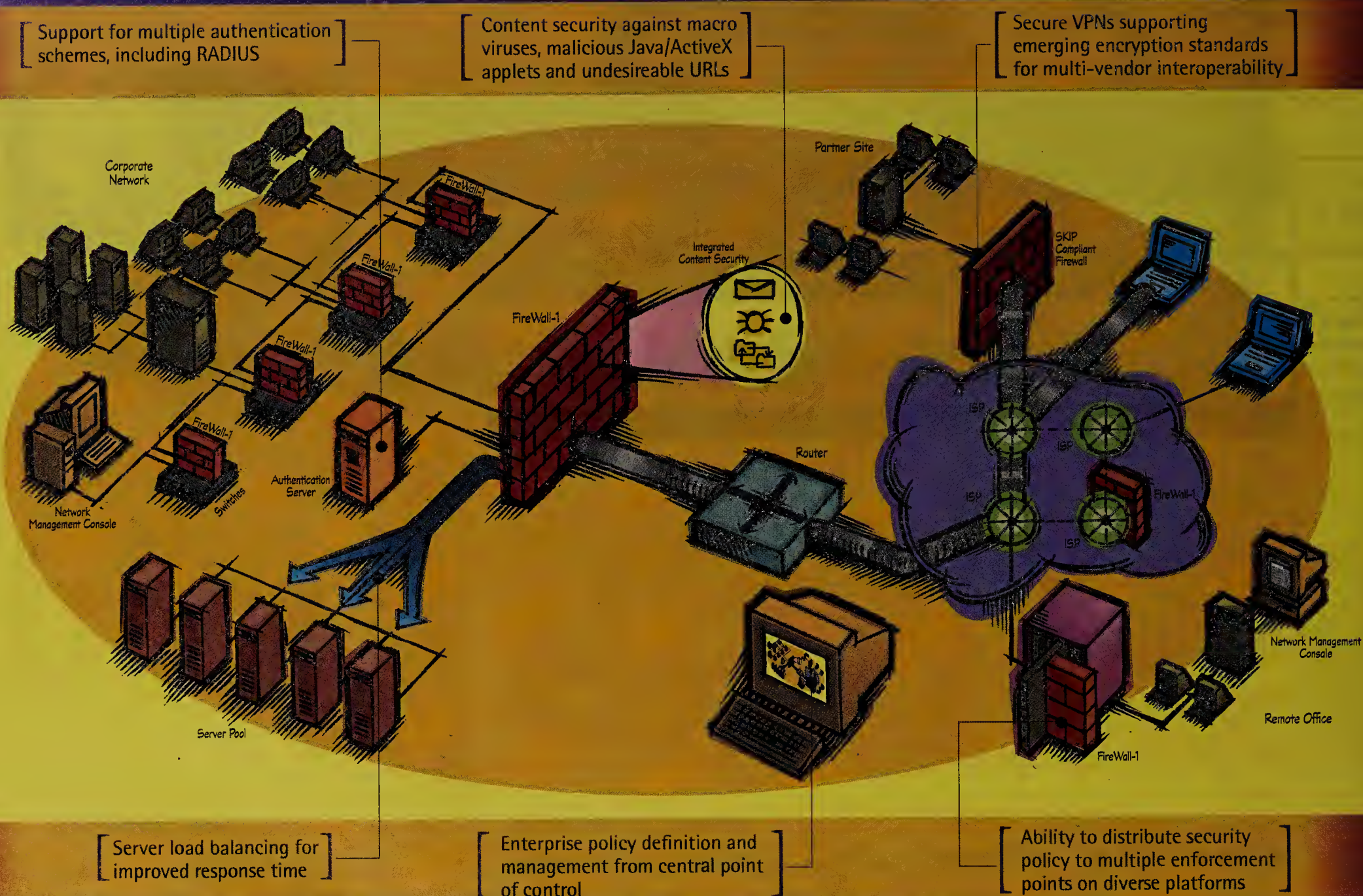
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1	Any	Web_Server_Pool	http	accept	Log	Gateways
2	Selected Any	SQL_Server	sqlnet2	User Auth	Log	Gateways
3	Network-Tokyo	Network-Tokyo	Encrypted_Services	Encrypt	Account	Gateways
4	Trusted Sites	Network-NY	http=Skip_JAVA, ActiveX	accept	Short	Gateways
5	Network-NY	NY-Router	Any	drop	Stamp/Trap	NY-Router
6	Network-Tokyo	Tokyo-Router	Any	drop	Alert	Gateways

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FireWall-1

IntraNet

April 1997
Volume 2, Number 4

FEATURES

16 Coming of age

Network World/IntraNet teams with Ernst & Young's Center for Technology Enablement to survey 300 intranet users in an attempt to answer key business and management questions.

COVER: Extra or extraordinary?

Here are the key issues you'll need to address if you're thinking about extending your intranet to trading partners. Cover photo by Pierre-Yves Goavec

28 Sticky business

3M, the master of adhesives, is stuck on the idea of using Web technology to bring its Notes and legacy system communities to a common ground.

34 Ouch! Those thorny management issues

Technical problems are a pain, but intranet managers are finding some administrative issues can be even more nettlesome.

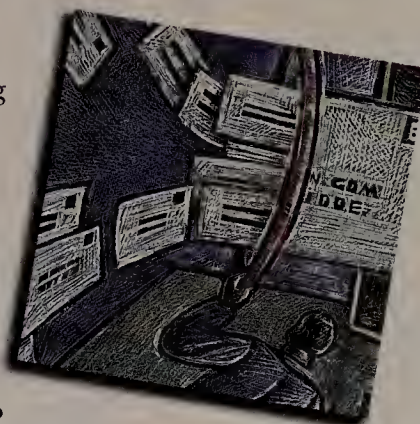
38 E-mail here, E-mail there: What's a company to do?

Ubiquitous Web browsers sporting easy-to-use E-mail functions are forcing companies to rethink their corporate messaging strategies.

41 Are you getting the oomph you expected?

In this Q&A, business professor Mary Cronin suggests if your intranet is not living up to its potential, it may be time to realign your efforts and target applications that can change the way you do business.

Watch out for those thorny management issues! Page 34.



DEPARTMENTS

Hot Links 7

Your virtual connection to newsbits, opinion, insight, humor and other marginalia from planet intranet.

IntraNet Handbook: Virtual private networks 9

When it comes to outsourcing private remote corporate Web access to ISPs, you've got to make sure you have the right mix of authentication, integrity and encryption functions.

Ask Dr. IntraNet 9

In this issue, the doctor discusses pop-up dialog boxes and tells us all about Netscape's "about:" URL.

Review: Folio's siteDirector 12

This Webified document management tool gets a thumbs-up for its flexibility, performance and usability.

Product Watch: Collaboration software entices users 14

Collaboration tools come in many forms, but one thing's for certain: They're becoming integral to intranets.

IntraVert: Close enough for rock and roll 46

When it comes to storing and retrieving a corporation's data, information and knowledge, intranets can carry the tune.



From the Editor

Promising new technology and applications are usually accompanied by banal buzzwords that, at the least, designate unnecessary new categories. Our favorite offender these days is "extranet."

Not that extranet applications aren't in fact real, useful and proliferating. But extranets do not make up a new technology category — they are simply intranets with their doors open to business partners.

"Intranet and extranet are the same thing," says Bill Raduchel, CIO at Sun Microsystems, Inc., an early intranet proponent that is now easing its employees onto diskless network computers (NC). Storing corporate data centrally and implementing the corresponding security avoids duplication of records and helps ensure that everyone — employee or business partner — has access to the most current information.

"I can't afford to buy different applications for employees and customers and business partners," Raduchel says. "They'll all access the same data, through the same applications, although they will have different degrees of access and may even see different fields."

The low cost of entry for intranets has enticed corporations; the extranet application continues that savings by enabling companies to offer a single point of access. The Webtop looks the same from any workstation or NC, inside or outside the corporation.

Whether you call it an intranet or an extranet is extraneous. It's how you go about it, and what you do with it, that counts.

Peggy Watt, senior editor (peggy_watt@nww.com)

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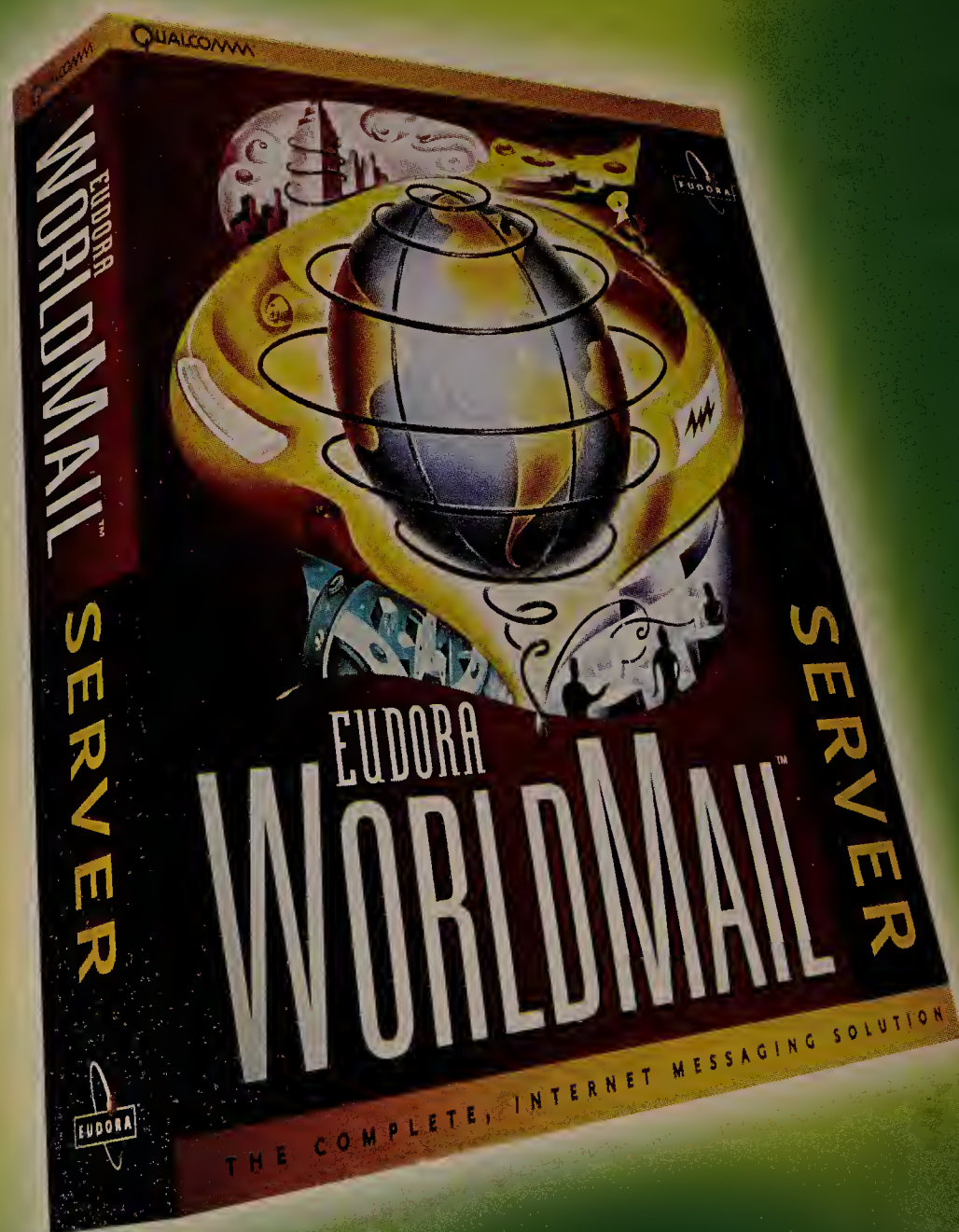
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Netscape and pals push crossware

Netscape Communications Corp. is amassing an impressive army of allies in the browser wars.

Approximately four dozen prominent Web-oriented developers have pledged support for so-called crossware standards. The crossware effort encourages modular, scalable, platform-independent programs that will easily allow business partners, customers and other invited guests to access an intranet, according to Marc Andreessen, Netscape's senior vice president of technology.

Initial crossware standards are the Lightweight Directory Access Protocol, Secure/Multi-purpose Internet Mail Extensions, vCard, EDIINT and Signed Objects.

"It's important for vendors to support these, so users can expand their intranets to sup-



Netscape's Andreessen

port very large, mission-critical extranets," Andreessen says.

Netscape expects to implement crossware technology in its applications this summer and next year.

The lineup includes the Constellation environment that extends the Navigator browser, updates to the SuiteSpot server and new applications such as the Compass workflow manager and Gemini rendering engine.

A crossware white paper is at home.netscape.com/comprod/at_work/white_paper/extranet-stds.html.

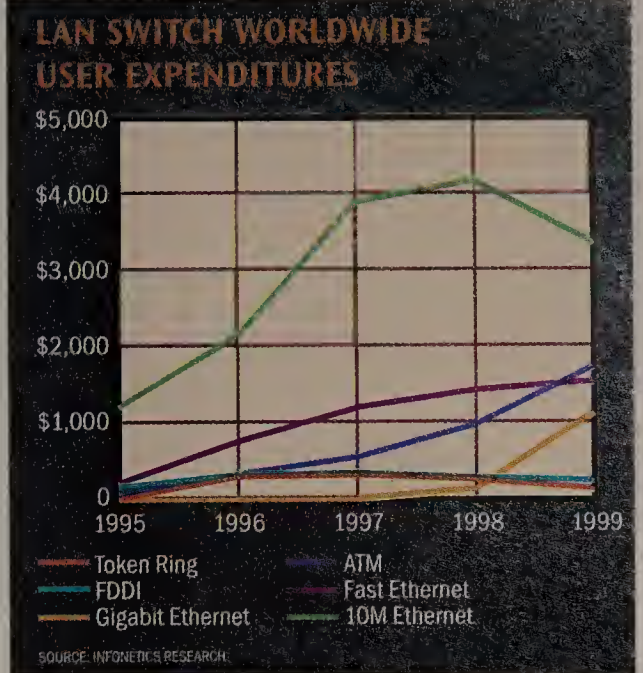
Intranets drive switch buys

LAN switch sales are up, and intranets get part of the credit.

Intranets are the application most responsible for high-performance LAN equipment purchases, say 50% of respondents to a survey conducted by market research firm Infonetics Research, Inc. of San Jose, Calif. The No. 2 reason, support for distributed databases, topped

last year's list, but users never before have mentioned intranets in the annual survey, says J'Amy Napolitan, Infonetics chief operating officer and senior analyst.

The survey involved IT decision makers at 107 organizations that have at least one installation of 10M bit/sec Ethernet to the desktop or 100M bit/sec in the LAN backbone. The mean average size of the companies is 13,000 employees.



Digital librarians organize Corning

Librarians are getting a new lease on life thanks to intranets, says Duane Davis, project manager of the Library of the Future Project in the Science & Technology Division of Corning, Inc.

The Library of the Future provides browser-based access to a broad online library of traditional and new works. Designed with the help of the professional library staff at the Corning, N.Y., company, the Library of the Future has two

sites: the business-oriented Corning Today, which uses more graphics and links, and the text-only Corning Tomorrow, which features technical materials.

"The online Library was cost-driven," Davis says. Executives wanted to spend less on technical journals, both to save on multiple subscriptions and to avoid having to build a bigger physical library. Today, Corning users hit the year-old library site some 80,000 times monthly.

INTRANET EVENT LINEUP

Intranets remain the topic of the day at numerous industry gatherings. Here's a sampling of intranet-related events coming up this spring.

Internet Expo	Chicago	April 22-24	DCI	(508) 470-3880; www.DCIexpo.com
NetWorld+Interop	Las Vegas	May 5-9	Softbank Expos	(617) 433-1500; www.interop.com/index.html
Microsoft Tech Ed	Orlando	May 5-9	Microsoft	(800) 433-9996; www.microsoft.com/events/teched
Implementing & Managing Extranets	Chicago	May 6-8	IQPC	(800) 303-9160; www.iqpc.com
Implementing and Managing Internal Web Sites for Customer Service	Atlanta	May 14-16	IQPC	(800) 303-9160; www.iqpc.com
Comdex/Spring '97, Windows World, Spring CES, Expo Com USA	Atlanta	June 2-5	Softbank Expos	(617) 433-1500; www.comdex.com

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Circle Reader Service #1



VPNs: Providing secure access to the intranet

BY ALEX HENTHORN

First comes a department or two, then headquarters, followed by corporate sites scattered around the world. Before you know it, sales staffers and other on-the-go employees also want access to the corporate Web.

It's great to extend the intranet beyond the confines of corporate headquarters, but along with that access comes security concerns. What's an intranet manager to do?

The answer, in many cases, is to rely on virtual private networking (VPN). With this technology, intranet managers can outsource private remote corporate Web access to Internet service providers. With the Internet serving as a ubiquitously accessible backbone network, intranet managers can reduce the cost and complexity of delivering remote access to centralized Web-based information resources.

VPNs take private data, such as IP and IPX packets, and securely transport it over the Internet. Security functions are performed on IP packets, which are then encapsulated, or tunneled, inside other IP packets for routing across the Internet.

If you're considering extending access to the corporate Web using a VPN, your first and foremost concern should be security. Generally, it is easier for hackers to break into and exploit the

data on a corporate LAN from the Internet than it is for them to capture IP packets as they are routed through the Internet. This is because Internet routers are specialized, single-task computers with lean, security-hardened operating systems made only to route traffic across the Internet backbone. Additionally, Internet routers are typically administrated in a secure manner.

On the other hand, the general-purpose computers typically used for Web and E-mail servers, and sometimes even firewall gateways, use operating systems that are designed more for accessibility than security. This means they tend to have many exploitable security loopholes.

In order for a VPN to be truly secure, three security functions must be invoked. Authentication assures receivers that the sender is really the sender. Integrity assures receivers that when data arrives, it is only from the sender and that no third party has inserted data into the packet stream. Encryption assures receivers that only they can read the data.

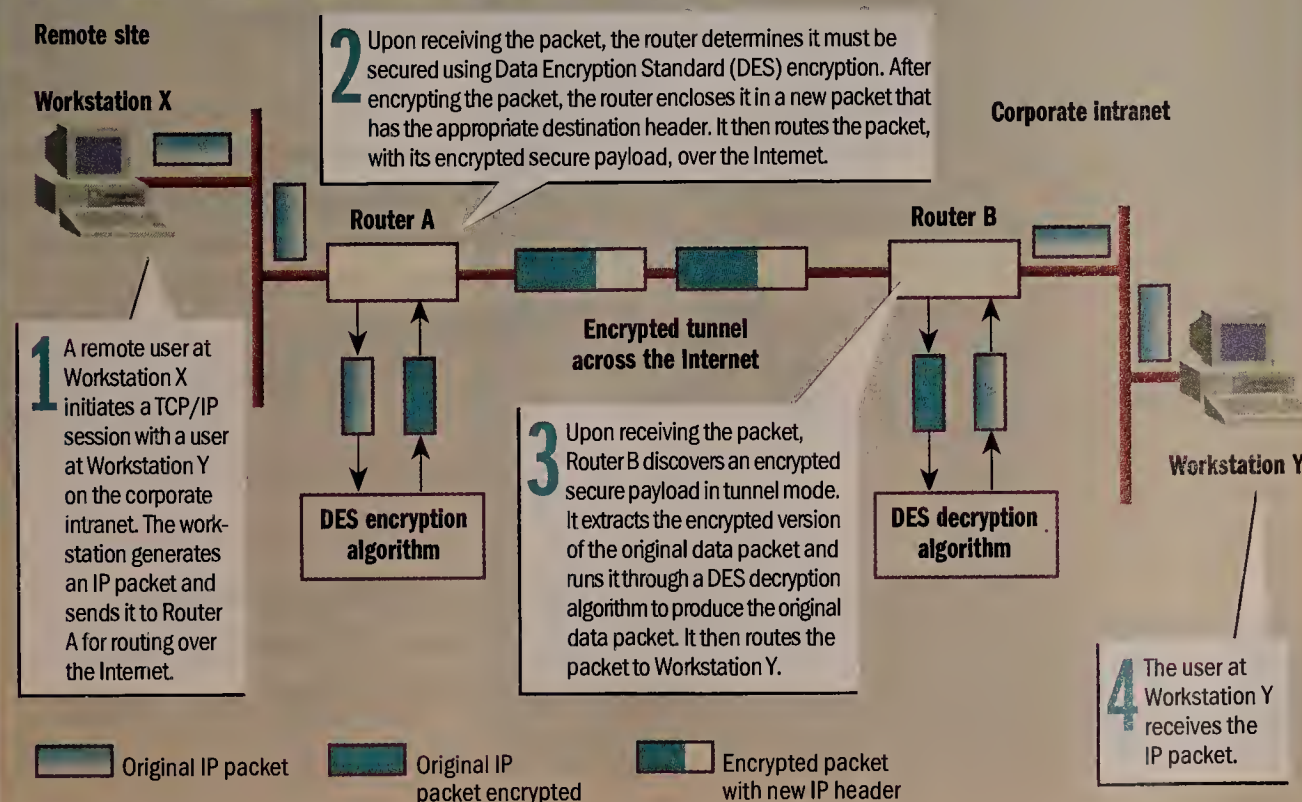
In a VPN, security functions must be applied to every IP packet that is transmitted because Layer 3 protocols such as IP are stateless — there is no way of telling if a packet is really associated with a particular connection. While upper-layer protocols such as TCP are stateful, their connection-tracking mechanisms aren't secure because they can be so easily duplicated or spoofed.

Without per-packet authentication and integrity, which typically can be implemented via software upgrades, a VPN does not have tunnel

See Handbook, page 11

TUNNELING IP ACROSS THE 'NET

The IETF's IP Security (IPSec) protocol provides a way to bury, or tunnel, encrypted IP packet payloads in wrapper IP packets for safe passage across the Internet.



ASK DR. INTRANET



Please step in and lie down. I understand the stresses and strains felt by network people developing and managing intranets, and I'm here to help. Send your problems to dr.intranet@nww.com.

On Network World Fusion, when you highlight a graphic, a yellow box pops up with a description. How is this done?

That's actually a function of Microsoft Corp.'s Internet Explorer (IE) browser.

Let me explain. HTML lets an author add an "alt" tag to images. This tag, which describes what the image is, was originally meant for blind people and people who don't use graphical browsers; if a site used a graphic as a hyperlink, these folks could either hear (through a voice synthesizer) or read, respectively, the link. Normally, you wouldn't see it in a graphical browser, but Microsoft decided to take advantage of that in later versions of IE.

In my recent playing around, I've discovered that Netscape Communications Corp.'s Communicator (which ultimately will replace Navigator) has the same feature.

I notice upon selecting "About Netscape..." from Navigator's Help menu option that the URL displayed in the Location field is "about:." Can you tell me what this about: URL is about?

Ah, good question. This is one of a number of internal proprietary URL-type identifiers Netscape uses for special functions. "about:" has several qualifiers: about:license displays the text of Netscape's license (as stored internally by Navigator), about:document lists attributes of the current URL loaded, about:plugins does a similar job for installed plug-ins, about:global lists the contents of the global history cache (the URLs your browser accessed and when), about:image-cache is for the images currently in memory cache and about:memory-cache lists the objects in memory cache.

Other special URLs include javascript:, livescript: and mocha:. These special URLs bring up a form to enter a command line for the respective interpreter.

Perhaps one of the most useful special URLs is about:cache, which produces a document that lists the URL, type, name, size, date retrieved and so on for pages and images in your local disk cache. The URLs of the cached items are links that will retrieve the cached items rather than the originals.

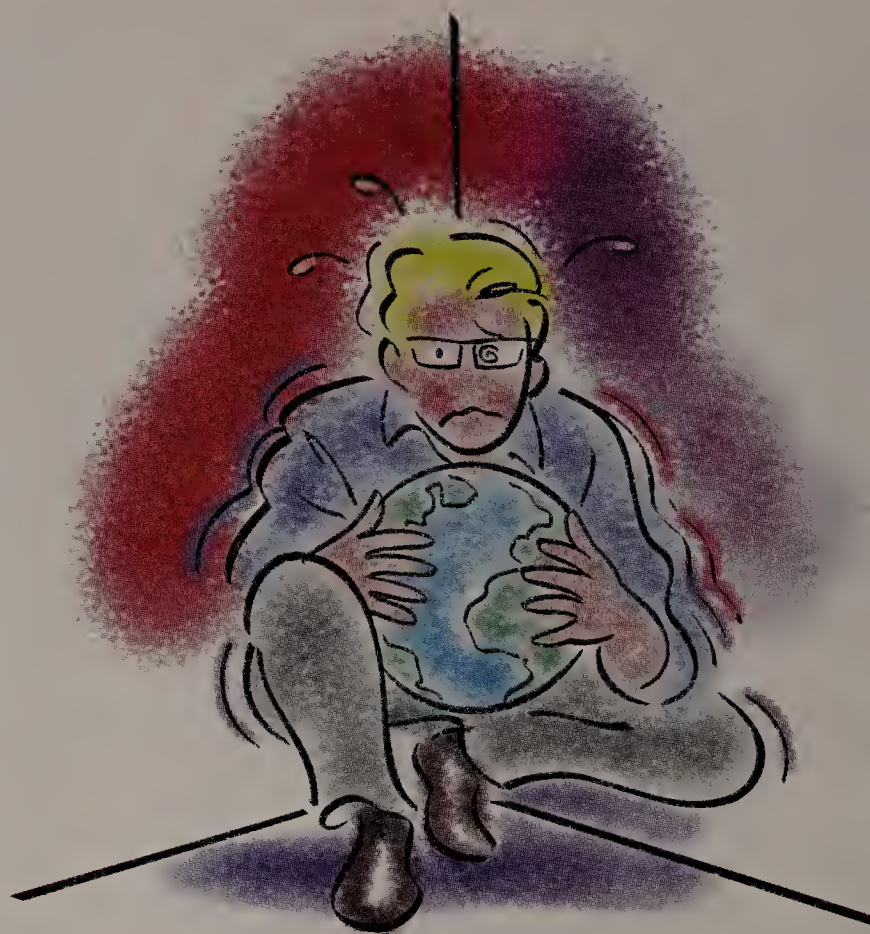
These identifiers basically act like regular URLs. The useful ones can be built into documents.

Let me know if you find any really good uses for these features on your intranet.

The IETF's IPSec protocol is the only VPN solution that provides authentication, integrity and encryption security functions.

In a VPN, security functions are performed on IP packets, which are then tunneled inside other IP packets for routing across the 'Net.

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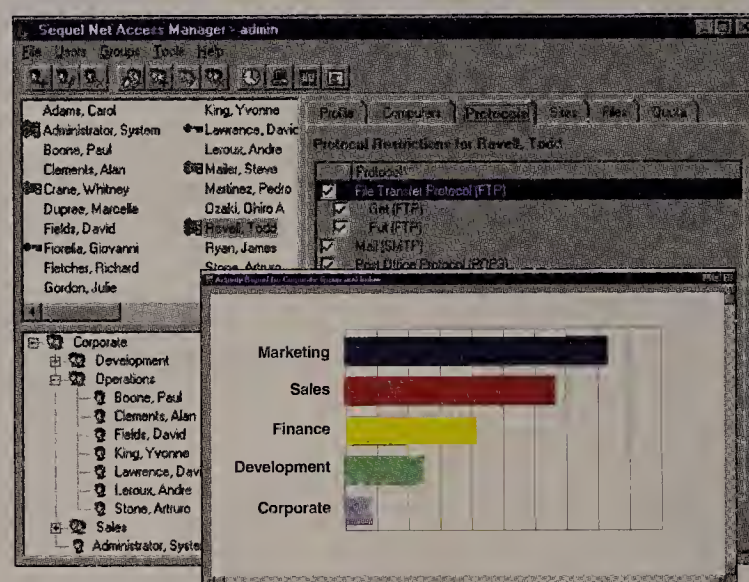
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Sequel Net Access Manager is a server based application and is available for Microsoft Windows NT™ Server 3.51 and

4.0 and Microsoft SQL Server 6.0 and 6.5. The Sequel Net Access Manager Client Administrator can be installed on Microsoft Windows 95 or Microsoft Windows NT Workstation 3.51 or 4.0.

"If you're a network manager or executive who wants to understand Internet-usage patterns or to block access to certain Web sites, take a good look at Net Access Manager."

Windows Sources, November 1996

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Handbook, continued from page 9
endpoint security. The VPN connection will compromise the firewall security.

The Internet Engineering Task Force (IETF) recognizes two standards-based algorithms for authentication and integrity. One is Message Digest Version 5 (MD5) and the other is Secure Hash Algorithm (SHA).

Encryption equation

Encryption, which is not always necessary, tends to be costly to implement because most communications devices such as routers can't encrypt streams of data and maintain normal levels of performance without specialized hardware.

To assess the need for encryption on your VPN, begin by identifying and classifying all the types of intranet data that could result in a loss to the organization if captured by an outsider.

Next, measure the data's potential opportunity cost, or the cost someone would be willing to incur to get that data.

Then identify and analyze the likely poachers of this data. Think about motives and financial resources.

At a minimum, the IETF endorses the use of the 56-bit Data Encryption Standard (DES) for encrypting most corporate data transmitted over a VPN.

The key to scalable security

Keys, the equivalent of personal identification numbers, are integral to the authentication, encryption and integrity functions. They are mixed into the security process, making the output mathematically impossible to decode without knowledge of the key.

And don't overlook key management, which is the process of automatically keeping security keys updated. In VPNs with only a few sites, manual updating of keys may be acceptable. However, in a large VPN, it is necessary to have an automated system to handle these updates.

Since security protocols such as MD5 and DES are available in source code form to anyone on the Internet, the keys really determine the strength of the security. This means keys must be updated or changed regularly to fend off attackers. Key management takes this security consideration and applies it to the operational dynamics of large networks.

The protocols

Four protocols are being pushed as VPN solutions. They are the Layer 2 Forwarding Protocol, the Layer 2 Tunneling Protocol and the Point-to-Point Tunneling Protocol promoted by various vendors, as well as the IETF's IP Security (IPSec) Protocol.

The first three are known as Layer 2 forwarding protocols because they first encapsulate Layer 3 packets such as AppleTalk, IP and IPX in the Layer 2 PPP before encapsulating them in IP. While billed as VPN solutions, these protocols have no packet-by-packet

encryption, authentication or integrity functions or a key management facility.

IPSec provides for packet-by-packet authentication, integrity and encryption. The IETF also plans to formally endorse a standards-based key management protocol called Internet Security Association and Key Management Protocol with Oakley key determination.

The IPSec protocols are the most

advanced VPN standards effort. They already are being tested extensively today by multiple vendors of remote access, firewall and other intranet-related software.

All of these arcane technical issues are important to keep in mind, but intranet managers must ultimately choose real products to implement a VPN.

The good news is that VPNs can be built using existing routers, gateways and desktop software that have been upgraded to support IPSec. ☹

Henthorn is senior technical product manager at Livingston Enterprises, Inc., a remote access vendor in Pleasanton, Calif. He can be reached via the Internet at alex@livingston.com.



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Folio's siteDirector 3.1:

Document management made easy

BY MARK GIBBS

What do you do about publishing on your intranet if you have a huge number of documents, huge documents, or even worse, huge numbers of huge documents? And what if you have to be able to control use and charge for access?

You'd likely turn to a handful of companies known for handling documents on PCs. One of the most successful of those companies is Folio Corp., which is now bringing its expertise to bear on intranets with siteDirector, a Webified document publishing system.

Operating as a Web server back-end application (otherwise called a script), siteDirector provides controls and meters browser access to document databases residing on Web servers. These document databases, called infobases, have embedded indexing.

Infobases, which are at the heart of Folio's regular and Webified publishing systems, can include text and hyperlinks to internal documents and external URLs, image files, OLE objects, video and audio files and binary applications. This allows for the creation of complex and content-rich document databases.

Many vendors of proprietary data, such as legal reference works, use infobase technology as a delivery mechanism because of its rich feature set. In addition, infobases appeal to informational product vendors because user access can be controlled at multiple levels of permission and usage can be metered. This provides, for example, a practical method for selling a single CD-ROM and limiting access to specific documents and optionally charging for actual access.

The Webified Folio system is valuable for creating enormous, multimedia-rich searchable document databases that can be retrieved by any browser-enabled user. For example, a large law office might post a legal publication created using infobase technology on the intranet. With siteDirector, any attorney who has a browser could access the data, no matter what operating system is running on the client.

This contrasts with the traditional Folio publishing system, for which each attorney would need a copy of the Folio Views client software. The latest version of siteDirector, 3.1, runs reliably and offers excellent performance in

access and searching. However, it was a complete pain to get siteDirector running, which, in my case, involved installing it on an existing Web server.

What's up, Doc?

For installation, Folio provides a small, four-page guide. Installing the Infobase Production Kit (IPK) and HomeSite 2.1, a bundled HTML editor, was pretty straightforward. Installing siteDirector itself was another matter.

In the paper and on-disk documentation, Folio claims it supports Microsoft Corp.'s Internet Information Server (IIS) and Netscape Communications Corp.'s Enterprise Server. But the installation program didn't know I was running IIS, so I had to configure the Web server manually.

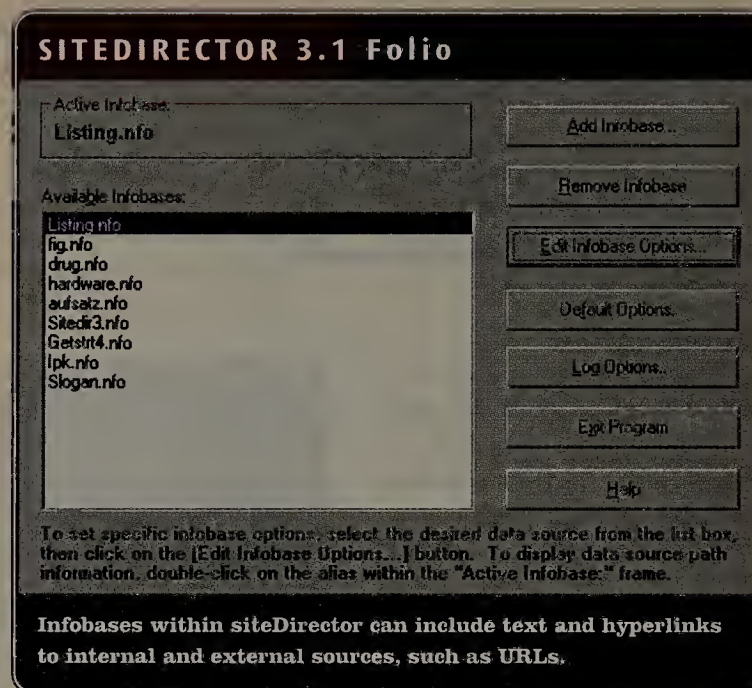
When I tried to bring siteDirector onto my existing IIS setup, I wound up with problems accessing some of the siteDirector Web pages because the URLs were not resolved correctly. I could dedicate the Web server to siteDirector, but in the process, I would lose access to my existing Web content.

Now, it's conceivable that if you have a significant document collection, the default configuration is just fine because serving infobases would probably be all you'd want the server to do. Nonetheless, it shouldn't be that hard to configure siteDirector for another Web server. (I eventually did figure out how to do it.)

Infobasics

Simple infobase construction can be done with the bundled Folio Views program, but for large amounts of data, Folio provides a specialized import utility. Both programs come with the IPK. Construction of infobases is quite complex because you're really working with a full-fledged document publishing system.

You can do a lot with infobases without much knowledge of Folio's document tag language (used for many of the same purposes as HTML, along with many infobase-specific features) and document construction automation system. But for serious document collections with sophisticated content, you'll need to have someone fully



Infobases within siteDirector can include text and hyperlinks to internal and external sources, such as URLs.

trained in building infobases.

Once you've constructed your infobases, you simply need to tell siteDirector where to find them and which templates, called SoftPages, to use in their display. You do this through the siteDirector configuration manager utility.

You can create or edit SoftPage files with any editing tool, but your task will be simpler if you use Folio's HomeSite utility. However, HomeSite is not nearly as graphical or functional as editors such as Microsoft's FrontPage.

By creating or editing SoftPage files, you can have siteDirector present information in any way you please, including the use of JavaScript, Java applets or ActiveX components on pages retrieved by siteDirector.

Infobases can be created from any data source.

An interesting option is to create content using Folio's Web Retriever, a utility that accepts URLs and copies URL contents, such as graphics, into infobases. In an intranet, for example, Web Retriever would let you take snapshots of useful internal and external sites, and allow you to search at a speed and detail level that the target sites might not support. Better still, where there's a link to a page that hasn't been downloaded into the infobase, the link will point to the original URL so Web browsers can seamlessly transfer to that page.

siteDirector plays an interesting role in environments that require content-usage tracking and billing. Folio offers its Meter API for activities such as session and event management. You need to create an application in C/C++ or another language that can call the API.

siteDirector is an impressive tool: Its flexibility is remarkable and its performance, even with huge, complex infobases, is excellent.

And Folio assures me it is working on the Web server integration problem. ☹

PRODUCT CAPSULE

- ▶ **Name:** siteDirector
- ▶ **Current release:** Version 3.1
- ▶ **Price:** Suggested retail price of \$9,995 per server. (A royalty is payable if the information is offered for sale.)
- ▶ **Requirements:** For siteDirector: Windows NT 3.51 or higher, a Pentium processor or better, 32M bytes of RAM, a 12M-byte hard disk; for IPK: Windows 3.1 or higher, 8M bytes of RAM, a 20M-byte hard disk; for HomeSite: Windows 3.1 or higher, 8M bytes of RAM, a 20M-byte hard disk.
- ▶ **Vendor:** Folio Corp., Provo, Utah
- ▶ **Contact information:**
Phone: (800) 543-6546
Web: www.folio.com

PROS AND CONS Folio's siteDirector 3.1

Pros

- ▶ Handles multigigabyte and complex documents
- ▶ Excellent search and retrieval performance
- ▶ Tremendous display configurability via SoftPage templates

Cons

- ▶ Difficult to integrate into an existing Web server
- ▶ Weak documentation for installation
- ▶ A serious learning curve is required to make the most of siteDirector

SUMMARY: siteDirector is a versatile, solidly engineered, high-performance, reliable solution for the document-handling problems that keep Webmasters awake at night.

RATING

Intranet usefulness	4
Quality	4
Value for money	4
Overall	4

1 is poor and 5 is excellent.



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Varied collaborative approaches entice intranet users

BY PEGGY WATT



collaboration tools come in many forms, but one thing's for certain: They're becoming integral to intranets.

Intranets even get credit from market research firm International Data Corp. (IDC) for last year's growth spurt in server-based collaborative enterprise environments. In a recent study, IDC in Framingham, Mass., found the number of new users in network-based integrated collaborative environments grew by 11.9 million in 1996, or 42.5%. This upsurge brings the installed base in such collaborative environments to 38.7 million users.

"Intranets are without question the single strongest force driving collaborative technology," says Ian Campbell, director of IDC's Collaborative and Intranet Computing Research Program. "As intranets encourage the sharing of information, collaborative applications become the technology that drives a real business return on an intranet investment."

The tools corporations and workgroups use to implement collaborative ventures on intranets varies widely. The key decision points seem to be how effectively a collaborative application meets a business need and how easy the application is to get up and rolling. Also, the collaborative tool that builds on what is already in place in the enterprise — that is, familiar to users and already funded — has a better shot at user acceptance.



Collaborative Tools

Chicago. InterAction tracks information stored in organizational, workgroup and individual directories.

InterAction users can view entries from each of the resources, which are typically isolated from one another, on one screen; and users can designate fields or notations for their eyes only or only for members of their workgroup. Updates to entries ripple through all the appropriate directories, and users can make

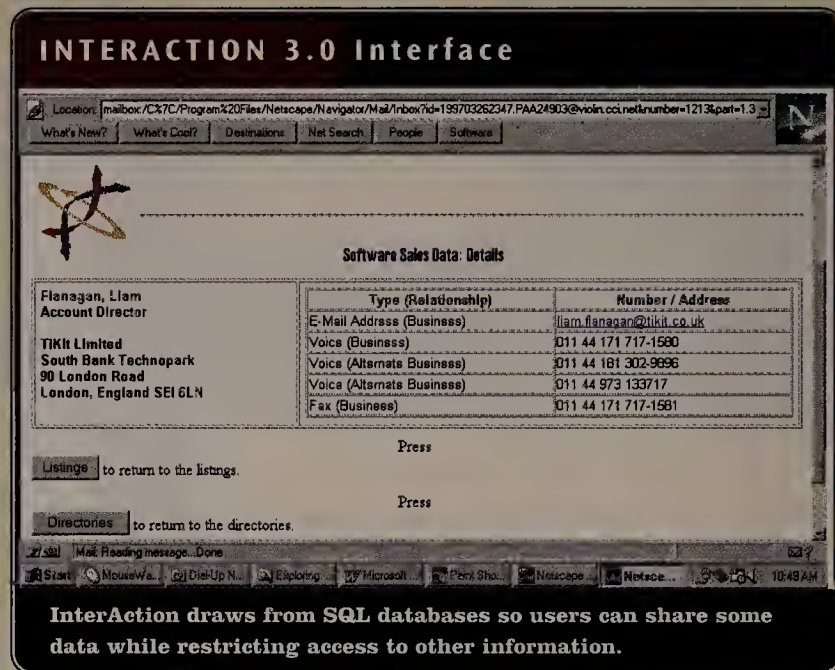
changes by dragging and dropping data links among records.

"We wanted a true enterprise solution, but not one that would take a cadre of consultants to implement," Holt says.

Users access InterAction through a browser or, at companies easing from the original address book program to the Webified version, a Windows-based proprietary interface. InterAction also supports replication in order to accommodate mobile users.

"This is an application that attracts people's attention and invites them into the intranet," says Dan Murray, a partner with the law offices of Jenner & Block in Chicago. InterAction's browser access makes it easier to supply information to traveling staff or remote members of the 300-person firm.

InterAction meets standards for integrating



InterAction draws from SQL databases so users can share some data while restricting access to other information.

to HTML and supports real-time updates.

"The browser interface is of particular interest because our strategy is to provide browser access to any application we deploy," says Kurt Rao, business development leader with New York-based Viacom, Inc., which replaced hundreds of individual paper Rolodexes with the electronic tracking system.

Collaboration from the get-go

Tools designed to help foster intranet communities are coming for those who have the luxury of implementing collaborative intranet environments from scratch rather than building on entrenched groupware.

Firefly Network, Inc. of Cambridge, Mass., for example, is preparing such an application suite. It will apply "feature-guided automated collaborative filtering" that learns users' interests from their actions and becomes more efficient at information retrieval the more a workgroup uses it, says Nick Grouf, president of Firefly.

First, every browser user gets a Firefly Passport from the server-based Passport Office, which registers new users and monitors user profiles. Firefly sites can recognize Passport holders and provide appropriate views based on previous actions or group affiliations.

A system manager handles setup using the Firefly Community Navigator, which is essentially the environment builder, and manages each user's access and views within the Firefly collaborative environment. For example, the Navigator can identify and display real-time activities of workgroup members, who can be represented on-screen by animated icons called avatars.

Users also can modify their environment and views by noting their interests in a Firefly "taste space" that identifies users with shared interests. The environment provides a chat space as well as single-button access to E-mail and other applications running on the intranet.

"The Firefly community is really a workgroup environment for an intranet," Grouf says. The program, which is entirely server-based and browser-accessible, is available on Windows NT and Sun Microsystems, Inc. Solaris.

SELECTED COLLABORATIVE PRODUCTS

COMPANY	URL	PRODUCT	PRICING	COMMENTS
Firefly	www.firefly.net	Firefly Community Navigator	\$4,000 per CPU	Available in Windows NT and Unix versions
Interface	www.interface.net	InterAction 3.0 Web Access 3.0	\$89 to \$209 per seat \$1,795	Reads SQL data
Oblix	www.oblix.com	IntraPower Suite 1.0	\$10 to \$20 per seat	Free for 30-day trial
SoftArc	www.softarc.com	FirstClass Intranet Server	\$2,000 per server, \$50 per seat	Upgrade to First-Class 3.5
StarBase	www.starbasecorp.com	StarTeam Workstation Workstation Professional VirtualTeam Server	\$199 per seat \$249 per seat \$949	Aimed at developers

One new collaborative tool, a contact manager from Interface Software, Inc., lets users draw from data in existing SQL databases, E-mail directories, calendar or scheduling programs, and similar sources. The product, called InterAction 3.0, is an enhanced version of an address book program used by law offices.

"It's designed so corporations can build on their corporate [intellectual] assets," says Terrance Holt, president of Interface in

with Microsoft Corp.'s BackOffice family of Windows NT server-based products. The contact manager integrates at the server level with Microsoft's Systems Management Server and SQL Server, and, at the desktop, can swap data with Schedule+, Microsoft's personal organizer.

"This is an attempt to satisfy the individual, group and enterprise needs," Holt says. The built-in Web gateway component, called InterAction Web Access 3.0, converts SQL data

Yet other collaborative applications are available out of the box.

Obliv, Inc. of Cupertino, Calif., for example, is shipping IntraPower Suite 1.0, which applies Java functions to such workgroup tools as an employee directory, an organizational chart, and resource scheduling and document-sharing applications. The applications are managed through the Administration Console, from which an IT manager can customize the interface to reflect the user company's structure and add corporate logos or workgroup designations. Application data directories can have public and private entries, for example, and users can modify some fields for their own view.

The applications import common file formats, such as vertical market programs for specialized corporate departments such as human resources, and integrate with Netscape Communications Corp.'s SuiteSpot server suite. IntraPower Suite 1.0 is available in versions for Solaris, Unix and Windows NT servers running Apache, Microsoft or Netscape Web server software. Webmasters can download a free 30-day trial copy from www.obliv.com/trial.html.

Collaborative software developer SoftArc, Inc. is Webifying its FirstClass enterprise groupware program with the release in May of FirstClass Intranet Server (previously referred to as FirstClass 4.0).

FirstClass Intranet Server supports Internet access and a visual application development component complete with templates and an icon library, says Scott Welch, vice president of SoftArc in Markham, Ontario. The product also combines the functions of directory, mail, news and Web servers, which are accessible from a browser.

FirstClass Intranet Server will ship first on Windows NT. An online demonstration is available at huskyplanes.com.

Collaborative development

Even developers are getting more collaborative tools for their work, thanks to the corporate Web. StarBase Corp. of Irvine, Calif., is releasing over the next few months several updates to its existing StarTeam collaborative development tools, with more Web-oriented functions.

StarBase touts its Software Configuration Management functions for use by virtual teams. Team members may be located anywhere and can efficiently collaborate on programming projects in the StarTeam environment. Programmers check out code and then return it with comments about their work. This way, the program monitors use and maintains version control on a work in progress, says Basil Maloney, marketing director at StarBase.

"We're groupware for developers," Maloney says. Programmers can link different parts of their project, he adds.

"[For example,] highlight the code, and you can link to a threaded confer-

ence session and see discussion of why the code is written as it is," Maloney says.

The StarTeam family is available in several configurations designed to accommodate programmers in small workgroups or across an enterprise. StarTeam Workstation is a peer-to-peer environment for LANs; Workstation Professional adds client/server func-

tionality. Both are scheduled to ship this month, along with VirtualTeam Server. Workstation Enterprise, which is analogous to StarTeam Server in earlier versions, adds task management functions and supports 100 or more programmers. StarTeam Webstation is the only desktop version that implements Java.

"We use StarTeam so we don't step

on each other's work," says Todd Skaggs, a software engineer with Fairchild Data Corp. in Scottsdale, Ariz.

Through user interfaces, E-mail and programmer's environments, intranet builders are stretching the workgroup's scope. Whatever form or audience is the target of collaboration tools, the point is extending communication — often by browser. ☺

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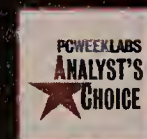


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Coming of Age

IntraNet/Ernst & Young survey chronicles how intranets are maturing.

While the industry is flooded with studies about how many intranet servers have shipped and what company is leading the browser wars, little effort has been made to investigate intranet management and business issues.

In an effort to tackle these and other topics, we joined forces with Ernst & Young's Center for Technology Enablement to survey 300 Network World/IntraNet readers, all of them intranet users.

The results were not so much surprising as reaffirming: The intranet freight train really is powered by more than hype. Companies are investing large sums of money, trust and hope in this relatively new technology. More than 85% of respondents, for example, say they agree or completely agree that Web browsers may become universal interfaces to all business applications.

But as young as intranets are, there is already some significant change in the works: Responsibilities are shifting, companies are changing the way they fund their networks and bill back for the services, and many intranet responsibilities are being centralized.

Let's let the numbers tell the story.

Responsibilities evolve with time

Almost three-fourths of respondents say they have a corporate intranet strategy. The IS/network department is most likely to have primary responsibility for implementing and managing the network, while creating the intranet strategy often falls to a special task force created to evaluate the technology.

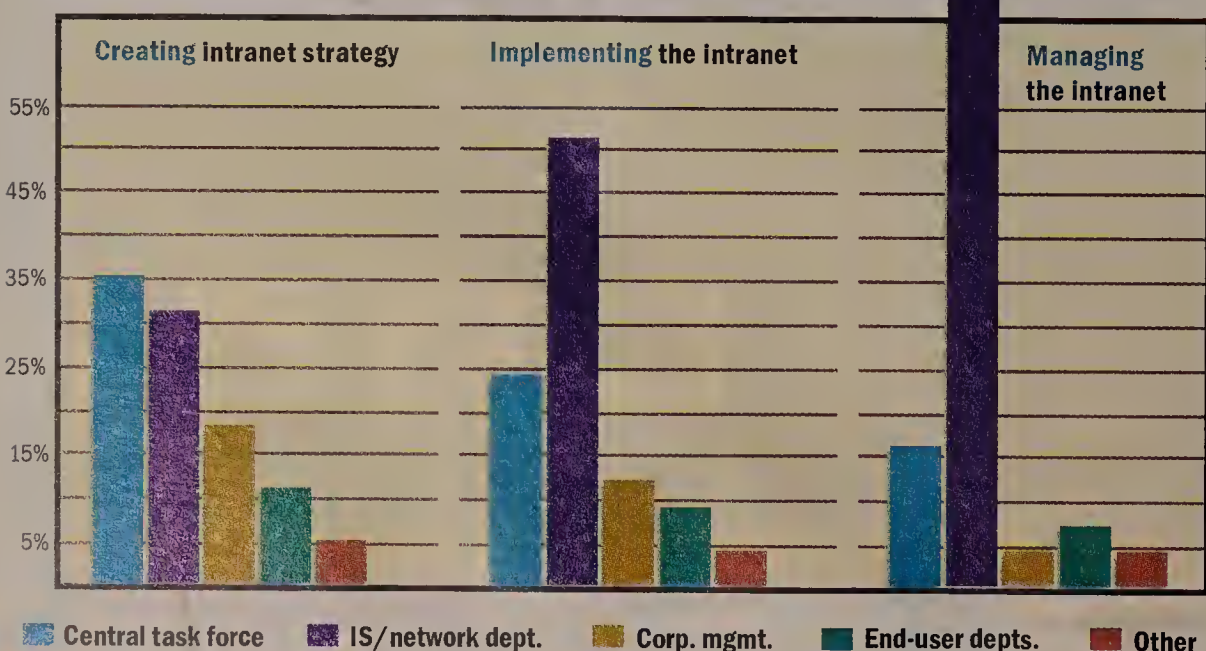
Does your company have a corporate intranet strategy?

No 27%

Yes 73%

Who has the primary responsibility for...

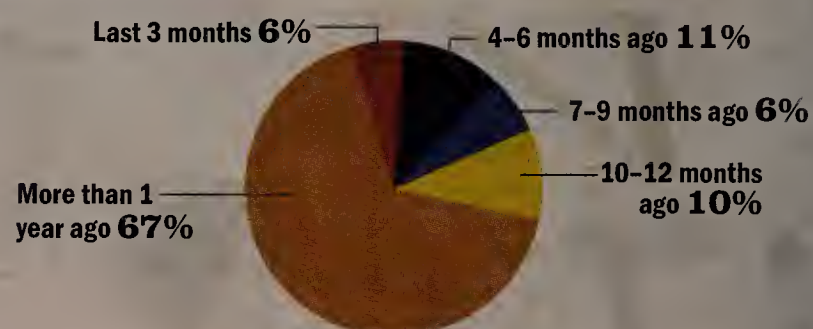
(Percentage of respondents)



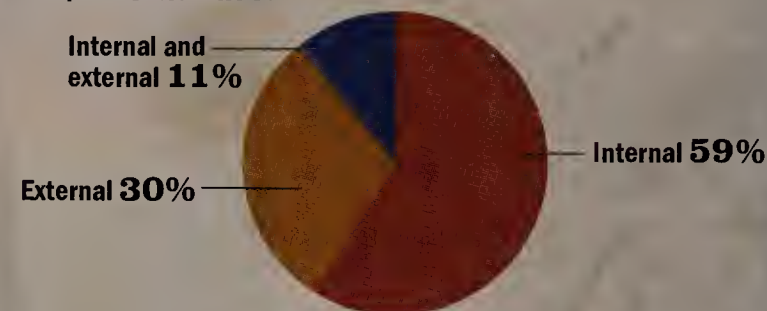
Snapshot of the companies surveyed

While companies really only began intranet implementation in earnest in the past two years, some 67% of the 300 users surveyed say they started to use the technology more than a year ago. Of the Web servers in use at the companies surveyed, close to 60% are dedicated to internal use.

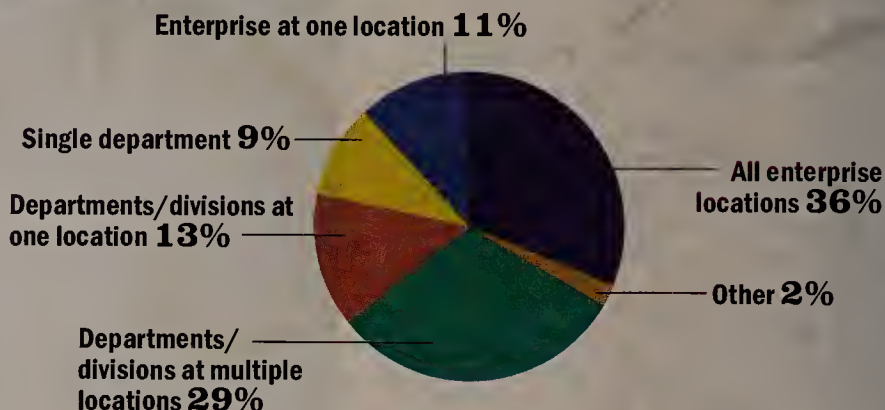
When did you launch your intranet?



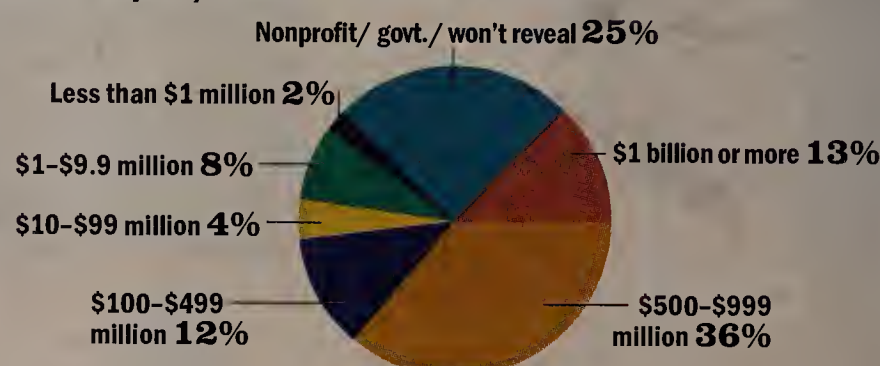
What percentage of your Web servers are dedicated to internal/external use?



You buy intranet products/services for...



Your company's total revenue for 1996



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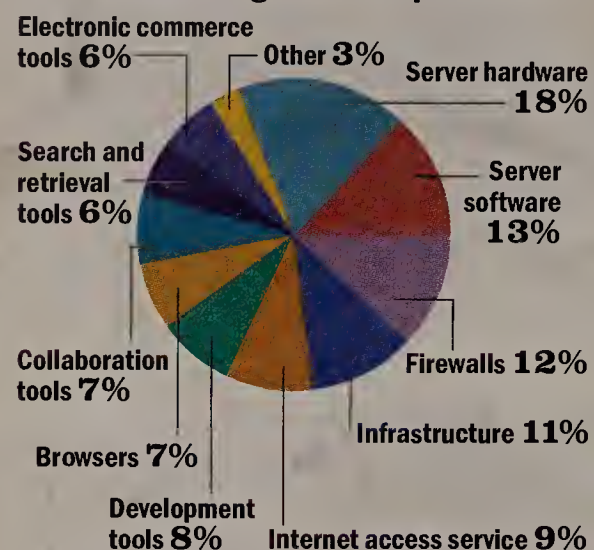
Strategic purchasing trends

What percentage of your budget is allocated to Intranet-/intranet-related products and services?

Overall, the survey revealed that, on average, companies plan to spend \$13.5 million on intranet products and \$13.3 million on intranet services over the next 12 months.

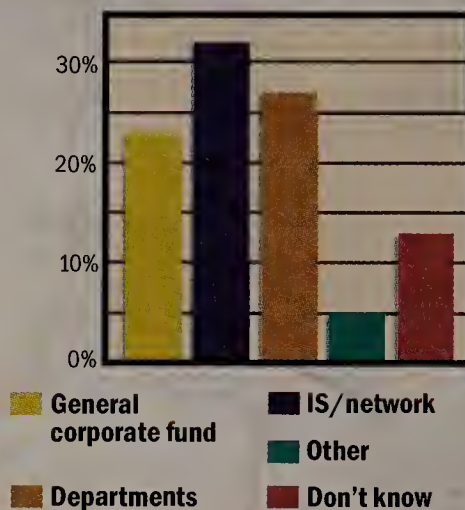
Because there is evidence that companies are centralizing control of intranets, it is not surprising that 86% of respondents agree their companies are interested in creating standards for departments to follow. This does not mean, however, that users are interested in settling on one particular vendor or buying prepackaged solutions.

How will your intranet budget be allocated among these 10 products?



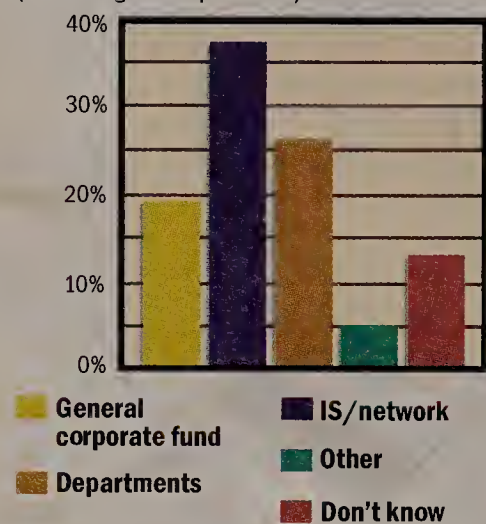
Who is footing the bill for building the intranet?

(Percentage of respondents)



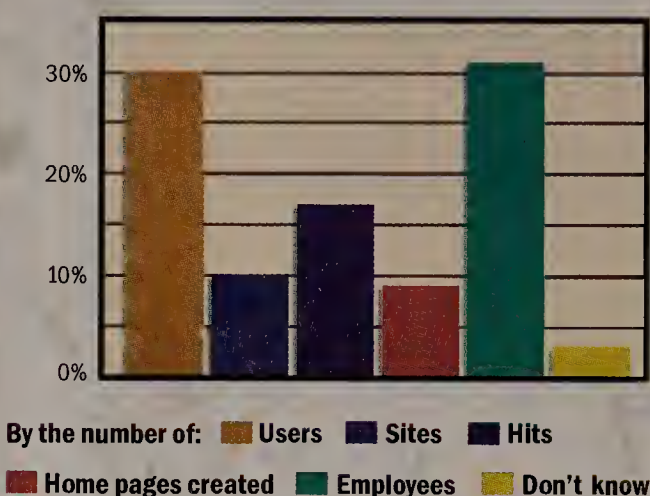
Who is footing the bill for managing the intranet?

(Percentage of respondents)



Where departments are footing the managerial bill, how are the costs allocated?

(Percentage of respondents)



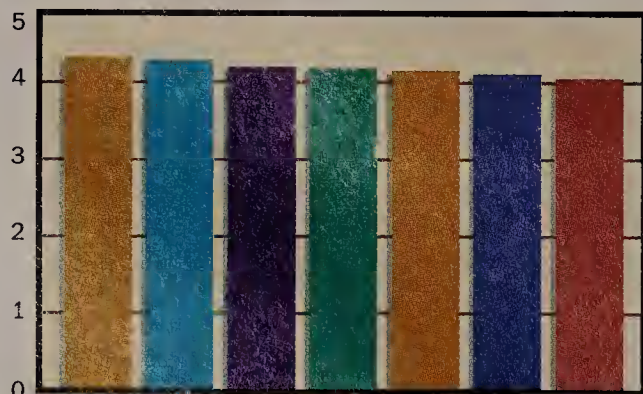
Perceived benefits

Three distinct types of intranet benefits emerged from this study. The benefits relate to information flow, business activities and internal management of the enterprise.

We asked respondents if they completely agreed (5) or completely disagreed (1) with the following benefits.

Information flow benefits

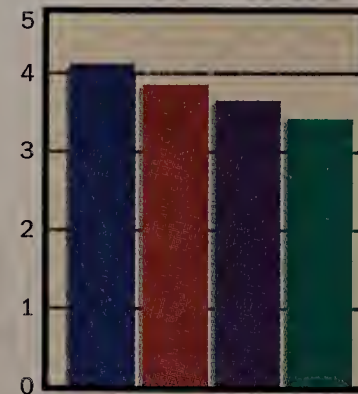
Overall, the greatest benefits companies realized from their intranets relate to internal information flow. Specifically, intranets:



- Allows for quicker collection and distribution of information
- Keeps employees better informed
- Simplifies user access to information
- Facilitates reuse of corporate knowledge
- Enhances productivity of the enterprise
- Lowers cost of delivering information
- Facilitates information

Business benefits

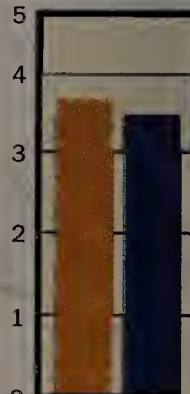
While respondents agree that the intranet provides business advantages, respondents are less likely to agree about the intranet's ability to improve customer and supplier relations and generate revenue.



- Provides critical business advantage
- Makes it easier to interact with customers
- Makes it easier to interact with suppliers
- Enables us to generate additional revenue

Management benefits

While ranking below the other two categories, users say they see some benefit to using the intranet to manage IS resources.



- Eases deployment and management of applications
- Reduces IS costs in the long run

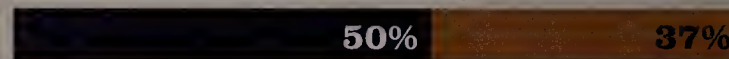
Putting it in perspective

The intranet phenomenon continues — 87% of respondents agree that use of intranets will increase dramatically in the next 12 months. That belief may be fired by the fact that most respondents (86%) say Web browsers have potential as universal interfaces to other applications. In fact, almost half of respondents (44%) anticipate using the intranet model to support all corporate business applications.

Usage trends

■ Completely agree ■ Agree

Intranet usage will increase dramatically:



Web browsers may become universal interfaces:

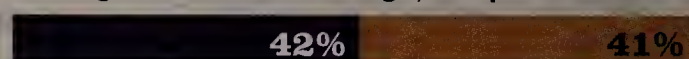


Intranets ultimately will support all corporate business applications:



Corporate strategies

Creating an intranet was a strategic, enterprisewide decision:



We are centralizing information flow and coordination:



We have set up a task force to promote deployment:



We have a master intranet plan:



Managing the intranet

The intranet is centrally managed:



The Web servers are centrally located:



Application deployment is often informal and tactical:





"Your RAS is mine..."

**...the rabid salesman
screamed as he combed the
halls with a noose.**

**"I can't log in!
Who's the IS guy who picked
the remote access server?"
Cornered, I grabbed a stapler.**

**"If I'm going out,
I'm taking you with me!"
I screamed as...
I woke up in a cold sweat.**

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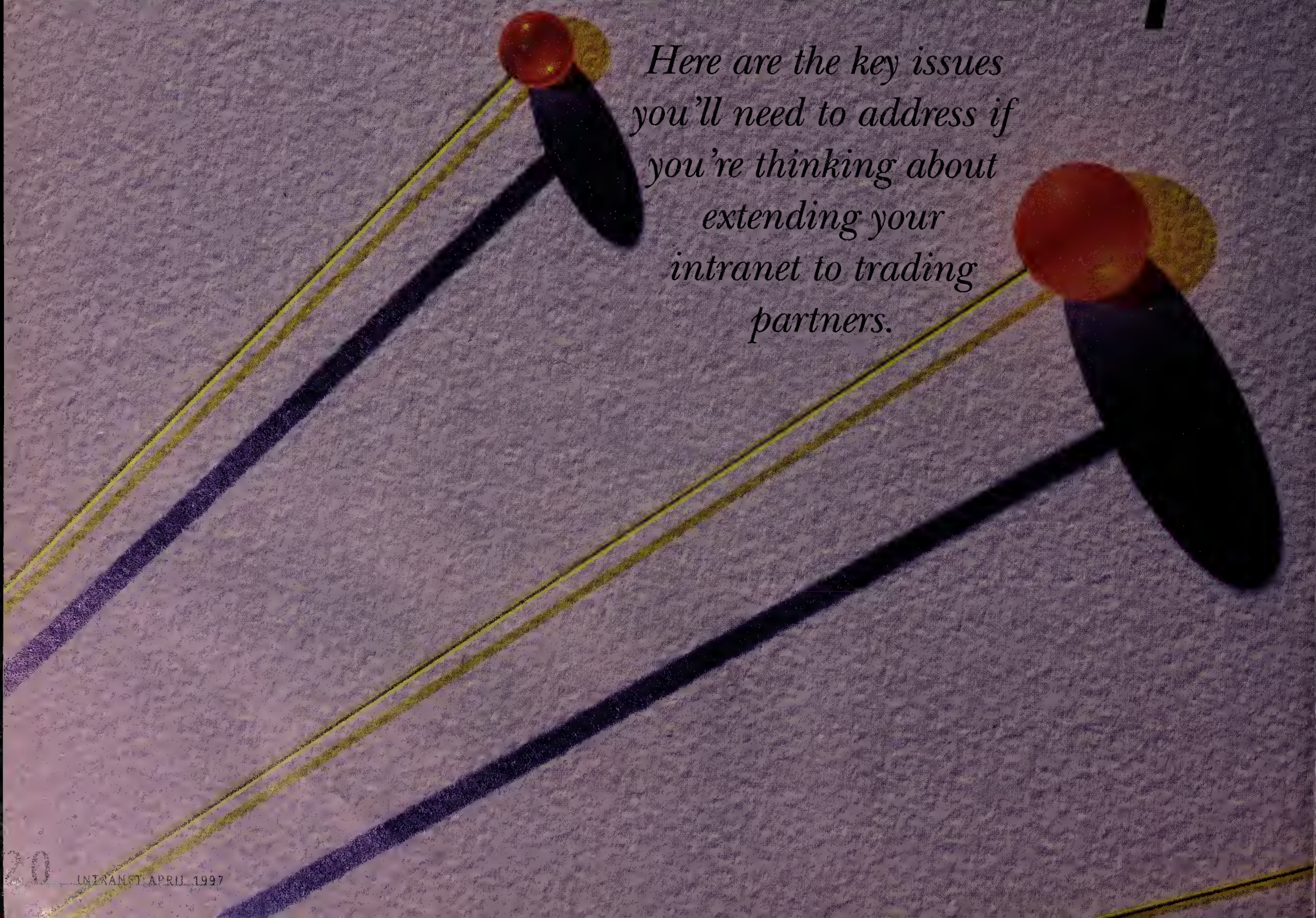


How fast do you want to get there?

Extra or extraordinary?

BY JAMES KOBIELUS

*Here are the key issues
you'll need to address if
you're thinking about
extending your
intranet to trading
partners.*

An abstract graphic featuring two stylized figures, each with a red spherical head and a dark, elongated body. They are positioned diagonally, holding long poles that intersect. The background is a textured, light gray.

Wondering what the "extra" is in extranets? At heart, the concept refers to extending your intranet by adding extra links to key trading partners, be they customers, dealers, distributors, suppliers or contractors.

But the real extra is in the payback, says Mary Cronin, professor of management in Boston College's department of strategic management and operations. Using your intranet to change the way you deal with trading partners may be the single most strategic thing you can achieve with your intranet investment (see the Q&A with Cronin on page 41).

Setting up extranets usually involves considerable management-level coordination due to the risks associated with providing partners access to your business data. Assuming you have identified trusted trading partners willing to do business online, how do you implement an extranet?

One or more of the trading partners host on their computers the principal applications, databases and documents required by all partners. Typically, this arrangement is characterized by a dueling firewalls topology, in which companies provide each other with secure, tunneled access (i.e., secure associations involving network-level packet encryption) to their respective intranets over the public Internet.

Countrywide Home Loans, Inc. of Pasadena, Calif., for example, has established a Web-based extranet application, based on Netscape Communications Corp.'s Netscape server and security products, that enables its bank and mortgage broker partners to access loan-processing and financial databases. The application, called Platinum Lender Access, lets banks complete mortgage applications, check account histories and interest rates, and track loan status online.

Chances are you already have most if not all of the basic ingredients needed to add extranet functionality, including Web servers, proxy servers and firewalls.

Pot of gold

The most fundamental component of an extranet, however, is the pool of business information you want trading partners to access.

You may, for example, choose to provide cus-

tomers with access to your online purchasing and inventory systems to track the status of their orders, or allow engineering contractors real-time access to CAD/CAM specifications and drawings.

Providing partners with such access may be as simple as adding them to the relevant applications' authorized access control lists.

In other words, extranets are usually logical overlays, defined only by access privileges and routing tables, on today's intranet and Internet infrastructure, rather than new physical networks in their own right.

But a single Web server hanging out in cyberspace does not an extranet make. Extranets usually connect two or more pre-existing intranets, each of which may consist of anywhere from a handful to scores of internal Web sites.

As you and your trading partners get deeper into each others' business processes, you will probably want to provide access to a wider range of databases, documents and other resources on your respective intranets. These shared resources can then serve as the basis for coordination and collaboration among internal and external personnel.

You and your extranet partners should consider adopting a common Web-based application environment, such as Lotus Development Corp.'s Domino, Netscape SuiteSpot or OpenText, Inc.'s LiveLink, that provide capabilities such as distributed libraries, bulletin boards, messaging, workflow, calendaring, newsgroups and database/document access. You can scarcely build a viable extranet without strong collaboration tools, so you should explore groupware-like functionality in earnest.

SNAP-ON TRADING PARTNERS

Snap-On Tools Co. in Kenosha, Wis., a leading manufacturer and distributor of tools and shop equipment, is an extranet success story. Netscape Communications Corp. profiles on its home page. Snap-On's extranet is used to deliver information to 4,000 domestic dealers.

Since December 1996, Snap-On has provided dealers with password-protected, browser-based access to company product catalogs, promotional data, news items, reference materials and discussion groups. These applications run on Netscape's Enterprise Server, Proxy Server, News Server and Mail Server software, which

Proxy servers

As your intranet funnels more traffic to and from extranets, you and your trading partners may find it prudent to set up proxy servers, also called application-level gateways. These nodes sit between your intranet and the extranet, intercepting and consolidating internal users' requests for external Web pages (such as those residing on trading partners' sites), caching frequently accessed pages and controlling outbound access to services at the application level.

Proxy servers — available from the likes of Netscape, Microsoft Corp. and other Internet software vendors — can help you prevent redundant extranet page or file downloads from bogging down your intranet. By presenting a single corporatewide IP address to the outside world, proxy servers can also help protect intranet servers from hackers.

You can configure proxy servers flexibly in keeping with your extranet requirements. You may choose to implement one centralized proxy, one for each intranet/extranet service category (such as HTTP, File Transfer Protocol, telnet, Secure Sockets Layers, and Usenet/Network News Transfer Protocol), one for each region, or one for each trading partner connected to your intranet. Most commercial browsers provide users with the ability to direct various types of traffic to various proxies.

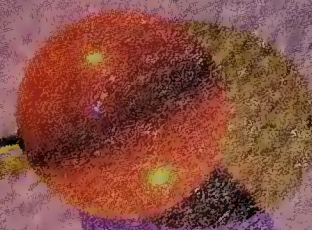
Firewalls

Firewalls are typically installed at the intranet's perimeter and, with their close cousins encrypting routers, usually serve as a company's sentinel or secure gateway to extranets and the Internet. Proxy

have been installed on servers on Snap-On's intranet.

Snap-On's extranet provides a forum for dealers to share tips on business practices, such as cash management and selling techniques, and to feed their comments and concerns to the vendor.

"Our extranet enables us to disseminate information to our dealers in a more timely and efficient manner..." says Bob Gingras, manager of electronic commerce at Snap-On, in the Netscape write-up. "We wanted to provide our dealers with a reliable and consistent information resource that would function 24 hours a day." Previously, the company communicated with dealers via regular postal mailings.



servers are usually situated on the intranet side of firewalls because their prime function is to serve internal users rather than filter inbound traffic from the Internet or extranet.

Firewalls often perform application-level proxy services, similar or identical to those just described, in addition to such core functionality as filtering and blocking packets at the network layer. Firewalls look at inbound and outbound packets' source and destination addresses, as well as the services being requested, and grant or deny access accordingly.

Firewalls keep casual Internet/extranet users away from precious company data, limit legitimate users to selected applications and databases, allow network administrators to monitor outbound communications, and produce a detailed audit trail of all successful and attempted logons.

One of the most critical decisions you'll have to make in setting up your extranet is determining what data to make available to your partners. Ideally, you would perform a thorough risk analysis, weighing the costs and benefits of hosting and securing sensitive business data in various locations, prior to making hosting decisions.

Your firewall, routers, Web servers and browsers will need to support two types of security services — authentication and encryption — in order to support high-volume extranet business transactions.

Authentication

The first rule of extranets is "trust but verify." When you provide a trusted partner with access to your intranet, you need to be able to authenticate their every network transaction, including logons, communications sessions, resource requests and

E-mail messages — even down to the packet level.

Today's authentication products allow companies to "spoofproof" their networks inside and out, verifying the origin and integrity of resource requests, files, messages, packets, sessions, software modules and network nodes. Secure tokens, digital signatures, certification authorities, credentials servers, biometrics and other advanced authentication technologies make it possible to secure access to the intranet and all networked information resources.

More and more authentication vendors are incorporating open standards into their products, enabling them to work with a range of third-party firewalls, communications gateways, applications and E-mail systems. Many authentication products use a mixture of public-key cryptographic techniques — such as RSA Data Security, Inc.'s Public Key Cryptography Standards — and secret-key technologies, such as Data Encryption Standard (DES) ciphers, to support user authentication along with secure key exchange and encryption, tamper-proofing and nonrepudiation services.

The most widely adopted authentication standards are outlined in the graphic above.

Many authentication products also support mutual authentication, a critical feature for secure intranets and extranets, which enables client and server software modules — or two Web servers communicating over the extranet — to verify each other's authenticity prior to establishing a connection or association.

Encryption

You may trust your trading partners completely but still have cold feet about transmitting sensitive business information to them over the Internet, which makes encryption essential for full-bore extranet commerce.

Encryption is supported by several of the security technologies discussed previously, including DES, Kerberos, SSL, S/MIME, and SET. Extranet users will probably employ all or most of these techniques, depending on the object being encrypted. DES typically encrypts and decrypts files for network transmission and storage. Kerberos typically encrypts a complete communications session between distributed LAN client and server applica-

respective trading partners, minimizing partners' exposure to unauthorized data access, tampering and theft.

Besides Internet service providers, other companies catering to this market include business-to-business online services such as Industry.Net, TradeCompass, TechnologyNet, and Valu.Net. These firms provide subscription-based electronic commerce within various vertical-market segments, providing a means whereby buyers and sellers who may never meet physically can conduct business in a

WHO'S CALLING?

If you're going to open your network to trading partners, you have to be able to authenticate their every move. The most widely adopted authentication standards include:

- **Kerberos:** An authentication service developed at the Massachusetts Institute of Technology that uses secret-key ciphers for authentication and encryption, authenticating requests for network resources rather than, as with authentication systems based on public-key cryptography, authorship of messages and documents.
- **X.509 public-key certificates:** An ITU-T standard that specifies the authentication service for X.500 directories and a syntax for public-key certificates.
- **Secure Sockets Layer (SSL):** A specification developed by Netscape Communications Corp. to support authentication and confidentiality for Web browsing sessions over the HTTP, File Transfer Protocol and telnet protocols.
- **Challenge-Handshake Authentication Protocol (CHAP):** An authentication technique defined in RFC 1334 supporting dial-up, remote authenticated user access to intranet/extranets over the PPP.
- **Remote Authentication Dial-In User Service (RADIUS):** A specification, developed by Livingston Enterprises, Inc. for authentication, authorization and accounting of remote user access in client/server environments.
- **Secure Multi-purpose Internet Mail Extensions (S/MIME):** An IETF standard that adds digital signature-based authentication (plus encryption) to Internet MIME messages described in RFC 1521, using X.509 public-key certificates.
- **Secure Electronic Transactions (SET):** A specification under development by MasterCard International, Inc. and Visa USA that will support secure payments using authenticated X.509-based electronic certificates in lieu of credit card or debit card numbers.

tions. SSL encrypts communications sessions between Web browsers and servers. S/MIME encrypts E-mail body parts and attachments. SET encrypts credit card numbers and other sensitive information on electronic-commerce transactions.

One specialized type of encryption that comes quite in handy on extranets is tunneling because it enables companies to build secure virtual private networks (VPN) over the Internet. Tunneling refers to the technique of encrypting packets so they can be transmitted confidentially over an insecure virtual circuit, such as an Internet TCP/IP connection.

There are no breakaway winner standards in the tunneling protocol sweepstakes. (For a list of the contenders, see graphic at left.)

Lack of widely accepted tunneling standards has limited the ability of trading partners to establish Internet-based VPNs between their respective firewalls.

Internet service providers

Of course, you can't set up an extranet without the services of one or more Internet service providers. ISPs are ramping up to support extranets by providing customers with end-to-end security through a combination of encrypting and tunneling routers, firewalls and browsers.

UUNET Technologies of Fairfax, Va., recently introduced VPN services, dubbed ExtraLink, that support network layer encryption through Cisco's Internetwork Operating System 11.2 encrypting routers, and secure remote dial-up network access from 845 worldwide points of presence.

managed environment.

One security advantage of externally hosted extranets, according to Ken Lewis, program manager for electronic commerce at EDS Corp., is the introduction of an "airwall" — lack of direct virtual and physical connectivity between trading partners' intranets.

EDS provides such a service for RAPID, Inc., a consortium of 40 agricultural chemical companies that use a Web-based extranet to support EDI, electronic funds transfer, inventory overstock resale and shipment tracking.

TUNNELING PROTOCOL SWEEPSTAKES

Tunneling enables companies to build secure virtual private paths across the Internet by encrypting packets. The leading tunneling methods include:

- **IPSecurity (IPSec):** The network-level authentication, data integrity and encryption features built into the emerging IP Version 6 and defined in RFCs 1826 and 1827.
- **Point-to-Point Tunneling Protocol (PPTP):** An extension to PPP that was developed by Microsoft Corp. and leading manufacturers of firewalls, routers and remote access servers. Supports tunneling of IP, IPX or NETBEUI protocols inside IP packets. Supports server-to-server and browser-to-server tunneling with Challenge-Handshake Authentication Protocol and Password Authentication Protocol authentication.
- **Layer 2 Tunneling Protocol (L2TP):** A proposed Internet standard combining Cisco Systems, Inc.'s Layer 2 Forwarding technology with Microsoft's PPTP.
- **Virtual Tunneling Protocol:** A proposed Internet standard that would use IPSec as the underlying security mechanism. Proprietary tunneling specifications from various router and firewall vendors, including Cisco, Check Point Software, Inc. and Trusted Information Systems, Inc.

BUILD VS. BUY

Although many companies view extranets as extensions of their intranet, in some cases it pays to have a third party host the applications and data to be shared among trading partners.

Externally hosted extranets are called on to support everything from electronic commerce to online product catalogs and electronic data interchange. The extranet service provider's computers remain outside the firewalls of the

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Booth #3999

Got Frame Relay Management on Your Mind?

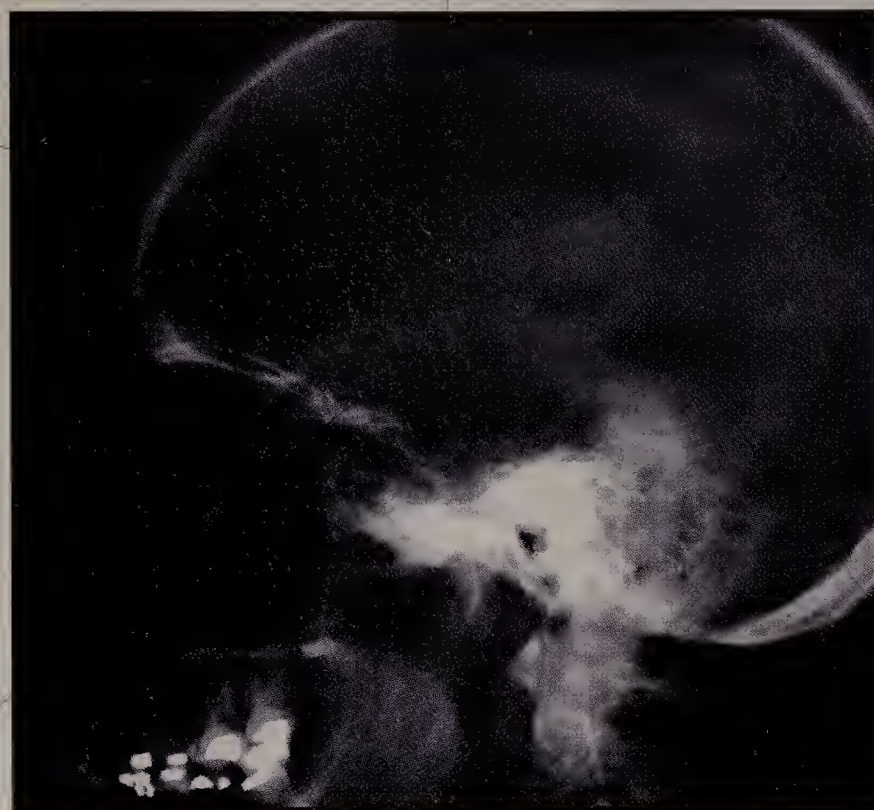
I need proactive tools that maximize network availability.

How do I know how much bandwidth I need?

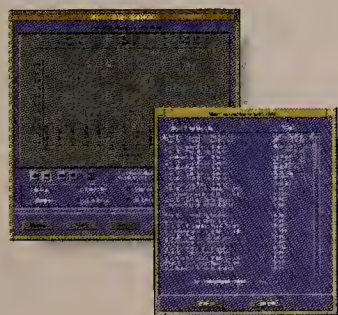
How do I know I'm getting what I paid for from my carrier?

I want to leverage my enterprise management platform.

How can I manage without Sync Circuit Management?



Think Sync.



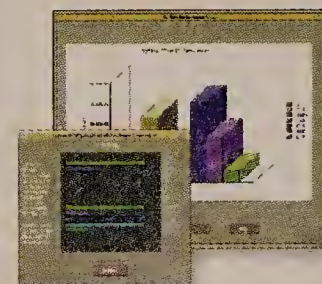
Managing your frame relay network can be mind-boggling. Sync's Frame Relay Access Probe (FRAP) and graphical enterprise management applications provide advanced circuit management functions

that let you examine the vast reaches of your network. You will gain insight to potential problems that can threaten your network's cost-effectiveness, performance and availability.

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tures. Detailed views of end-to-end network connectivity, bandwidth utilization, network and application level traffic—such as SNA, TCP/IP, browser and file transfers—and web-based reporting, will always keep you in the know.

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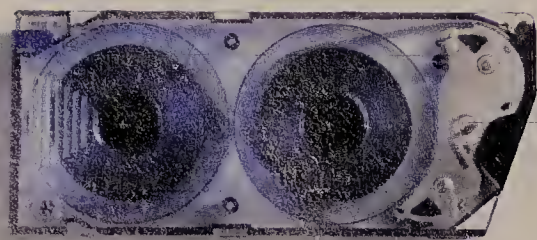




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now where it is.
icker to start here?

*Half the magazine
is this way.*



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needs. Visit www.storage.ibm.com for more information
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Solutions for a small planet™



"All customer traffic is encrypted end to end as part of a UUNET-managed service," says Jay Jonekait, the company's vice president of extranet services. The service can be deployed in conjunction with customers' existing firewalls. User authentication is supported through secure handheld challenge-

and-response tokens, such as those from token industry leader Security Dynamics Technologies, Inc.

UUNET's extranet services include performance guarantees of at least 99.9% availability for customers with 12 or more sites, and no more than 150 msec end-to-end transport delay over the

wide-area connection. Trading partners can each be billed separately for the traffic they load onto a UUNET-managed extranet, according to Jonekait.

Some Internet service providers take it a step further, offering to host the applications and data that trading partners want to share (see sidebar).

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TUNNELING FORWARD

In the past year, leading software vendors, systems integrators and network service providers have begun positioning their Internet/intranet offerings for extranet applications. Netscape Communications Corp. has incorporated Secure Sockets Layer authentication and encryption features into its Web browser and server products, and much of the industry has followed suit to create a de facto electronic-commerce security standard.

Leading router and firewall vendors now support industry-standard tunneling — packet encryption and encapsulation — technologies in their products, making it possible for two or more companies to establish secure virtual private networks over the Internet.

Ultimately, it doesn't much matter whether you shoulder the task of extending your intranet to trading partners or leave the driving to someone else. Reaching the decision to use your intranet as a platform on which to build strategic links to partners is what counts.

Although Professor Cronin dislikes the term extranets ("Extra" makes them sound superfluous," she says.), extending your intranet to key trading partners should make it possible to change everything from marketing plans to product development initiatives to customer support systems — the core of your business.

That will make your network extraordinary. ☺

TESTING INFOTEST

InfoTEST International, a Denver-based alliance of Fortune 500 companies and governmental organizations, is developing an experimental extranet called Enhanced Product Realization (EPR) for electronic-commerce and supply-chain applications.

InfoTEST's backers — including Caterpillar, Inc., Hewlett-Packard Co., IBM, Sandia National Laboratories, Sprint Corp. and Texas Instruments, Inc. — will link their intranets securely using route-based IP encryptors.

When implemented in the coming year, EPR will allow InfoTEST members to provide secure access to shared information resources, such as complex structured and unstructured information.

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STICKY

3M's intranet development team is using Web technology to bring its diverse computing environments into a cohesive whole.

BY BETH SCHULTZ

3M, the master of adhesives, is stuck on Web technology.

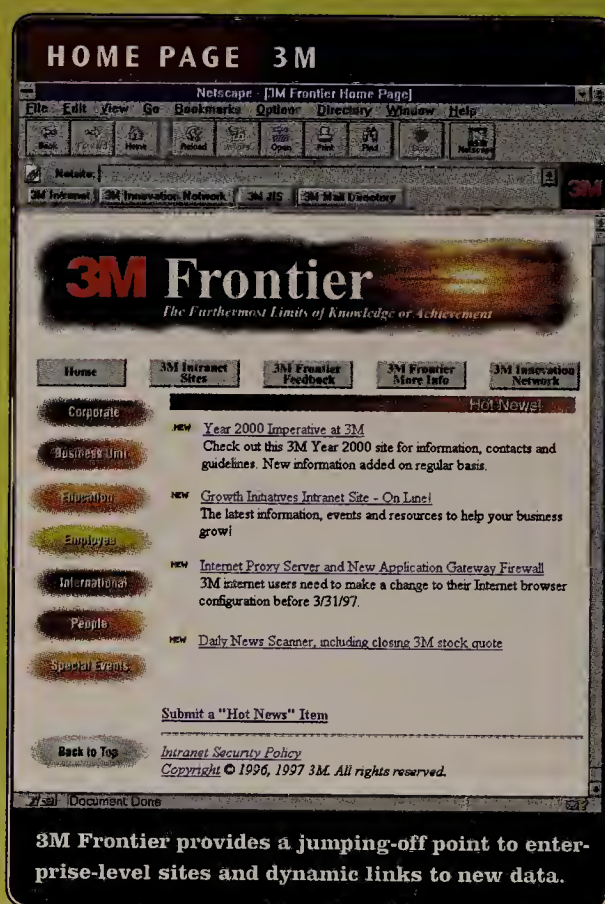
And that's good, because when 3Mers put their minds to something, positive results tend to happen. Witness those ubiquitous Post-it Notes, born of one employee's tinkering with funky, nonbinding adhesives and another's wish for sticky bookmarks for his hymnal.

The Post-it note story is just one of many 3Mers tell of innovations spawned by the company's encouragement of experimentation and creativity. Company executives expect each division to generate one-quarter of annual sales from products and services that are no more than five years old. Technical people are actively encouraged to spend up to 15% of their time on projects of their own choosing.

More than the grind

Katie McGaffigan invoked the 15% rule about four years ago when she began devoting part of her time as an IT analyst to figuring out how to improve the way employees obtained and shared information. She marshaled a group of 3M publishers into a self-directed, cross-functional team that began brainstorming on how to improve the way employees exchanged information.

3M did not officially back the effort, but informally sanctioned the work through the 15% rule, McGaffigan says. The team, which deliberately avoided the words "intranet" and "Notes" when it named its effort the Corporate Information Sharing Standards (CISS) project, ascertained early on that Internet technology would play a key role.



But the team knew 3M's thousands of Lotus Development Corp. Notes seats and terminal-based desktops using IBM's PROFS/Office-Vision weren't going away. So it had to find a method for providing this diverse universe with a way to access information at the click of a button.

The CISS team figured publishers ultimately would have to be able to post information on Gopher, Notes or Web servers to accommo-

date the mixed environment. IT would help them figure out the right tool, develop a menu structure that provided visibility for their information and support their server free of charge, McGaffigan says.

So the CISS team, comprising individuals from the corporate marketing and public affairs and IT departments, began a step-by-step approach to building this all-encompassing corporate Web. A lot of the team's energy, in fact, has focused on bringing the company's large Notes population onto the intranet.

Bringing on Notes

To integrate Notes and the intranet, the CISS team turned to Lotus' InterNotes, which provides a way to copy Notes databases onto Web servers. Browser-enabled users, then, can peruse the Notes databases to which they previously had no access.

For example, a communications newsletter can be created in Notes to take advantage of the document management capabilities. Then, using InterNotes, it can be copied to a Web server so a broader audience can look at it.

Some Notes databases from corporate marketing and public affairs already have been published on the Web and others have been targeted, says Mary Junker, CISS team member and office systems supervisor for 3M corporate marketing and public affairs.

But when it comes to really integrating Notes and the intranet, the CISS team is counting on Domino 1.5, which essentially is an HTTP server that runs on a Notes server. It also allows Web users without Notes to get

BUSINESS



With thousands of Notes seats and terminal-based desktops, 3M intranet developers faced an integration challenge. Team members are (from front to back, left to right): Kay Root, Norman Hickel, Phil LeTourneau, Mary Junker, Vicki Buehl, Katie McGaffigan, Glenn Wetz, Joseph Payne and David Mickelson.

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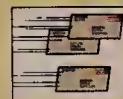
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NetworkWorld

This iteration is a bit brighter than its predecessors, but still relies more on text hyperlinks rather than jazzy icons that only those users with graphical

The CRN prototype group has at least a dozen intranet projects in progress, says David Mickelson, technology project leader for the CRN and a CISS team.

To keep some semblance of order as the 3M intranet grows, the CISS team has established a three-tier structure for the corporate Web. Sites are categorized as personal, business unit or enterprise. Personal pages are posted by individu-

Anyone who registers a site will require a manager's signature, a designated Webmaster and a separate infomaster, McGaffigan says. Webmasters are the technical people handling the site and the infomasters are those 3Mers responsible for the content. Then, if something goes awry, CISS team members know where to turn. The team has always relied on Webmasters, but only recently began using the infomaster designation. "The CISS committee can't be expected to know what's up-to-date — that's the infomasters' task," Junker says.

The CISS team has its work cut out. It's got to move Frontier from the static publishing platform it primarily is today to a fully interactive, dynamic environment. No doubt that will take much of the same gumption 3M developers have used for years to get innovative products such as masking tape and Scotchgard Fabric Protector to market. ☹

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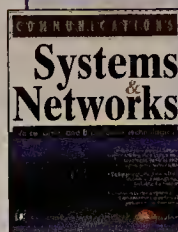
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Those thorny management issues

BY KELLY JACKSON HIGGINS

So who's running this intranet anyway? With links crisscrossing departments and burrowing down to the electrical engineer who put up a personal Web page, somebody must be in charge of the thorny administrative issues of content, style and policy for publishing and using the corporate Web.

Not exactly. Just as no single Web site makes up an intranet anymore, no lone Webmaster/enforcer exists, either. Today, most big businesses run their intranets in a highly decentralized, laissez-faire fashion, often with individual business units responsible for their own Web sites, content and policies. And no two business units' Web sites look the same — even if they are separated by no more than a click or two.

"Who owns it? Nobody and everybody, just like the Internet," says Gene Phifer, senior IT manager with Dallas-based Texas Instruments, Inc., which runs approximately 300 internal Web sites. Phifer, like other IT managers, is faced with weeding out everything from politics to presentation — prickly administrative issues that can be considerably more painful to deal with than technical ones.

Many IT departments such as TI's are steering clear of instituting stringent policy for what can and cannot go into the corporate Web, what the intranet should look like and who can contribute to it. Instead, IT has taken on the role of facilitator, providing Web publishing tools and, in some cases, server space. As part of this capacity, IT departments now find themselves working closely with corporate communications, which is shaping the vision of the intranet.

"We provide the basic infrastructure tools and the network for this to work on. We don't say, 'You can't bring up this Web site,'" Phifer says.

That decision is up to whichever organization or business unit sets up a Web site. In general, an intranet policy is merely an extension of a corporate one — publishing anything offensive or pornographic is off-limits, whether it be in a written memo or on a splashy Web page.

Beyond that, the frivolous or inappropriate information often gets quashed by the intranet community itself. "If someone puts up dumb or irrelevant information like a picture of his dog or something, he gets feedback from the community to take it off," Phifer says.

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Many businesses now are molding their collection of Web fiefdoms to look more like the structure of the organization, with a central Web that leads users to the various departments or business units. But this Web Central is nothing more than a main door into the intranet, comparable to a mall entrance.

What users find when they drill down from that main door depends on the culture of the individual business unit.

Aside from the uniform Back buttons leading to Xerox Corp.'s WebBoard home page, for instance, no rules are in place for how a site on the Xerox intranet should look.

"WebBoard has a very definite look and feel, but there's a lot of diversity" throughout the rest of the 100,000-page intranet, says Cindy Casselman, manager of strategic communications and intranet development for Xerox in Stamford, Conn. (For more information on the structure of Xerox Web, see *IntraNet*, July 1996, page 35.)

Microsoft Corp. also has a low-key attitude toward its guidelines for what and how to publish on its intranet, called MSWeb. The IT Group's Web site, for instance, provides some style guidelines for layout, color, graphics and confidentiality, but the group won't kill a page or site if it doesn't follow them.

"We want consistency, but we don't tell people what they can't do," says Marc Tramonte, director of learning and communication for Microsoft's IT Group in Redmond, Wash.

The danger in leaving content open for interpretation, however, is that it can get misinterpreted, industry experts say. Microsoft employees worldwide put up their own intranet home pages but not everything translates well. IT Group officials are constantly reviewing how to prevent misunderstandings, Tramonte says.

"What's acceptable in one country may not be in another — it could be considered offensive," says Paul Kraabel, president of Kraabel & Co., an IT consulting firm in Mercer Island, Wash. "Content management is a huge [administrative] issue."

The site ownership issue gets even more troublesome for universities, which by nature promote even more wide-open intranet participation. Indiana University (IU), for example, is struggling to balance

Intranet managers are finding administrative issues can be more nettlesome than technical ones.

its tenets of free speech with liability issues.

"The hottest issue now is who owns the student-created Web pages," says Sue Ferencz, director of policy and planning for the university. "Does the university own [Web content] and is, therefore, liable, or is it student-owned?"

Students at IU, such as those at other universities with intranets, use institution-issued accounts to set up their own Web sites. "We get complaints about whether this or that is appropriate for Indiana University," says Ferencz, who is located at the university's Bloomington campus.

Anything illegal, such as copyright infringements or plagiarism, is immediately brought down, and the student is disciplined. But where does the administration draw the line on lack of judgment? Even more confusing is how to handle student sites that link to other university-run ones, such as the Spanish department's home page.

"When you link to something, the ownership of a page becomes blurred," Ferencz says. Plus, the university is grappling with whether students should be allowed to put in links to these other sites at all. "It's the equivalent of using someone else's letterhead," she adds.

Keeping the information on an intranet updated and accurate typically falls to the authors of documents. A department Webmaster also may review the copy or page for updates. Xerox's Casselman says she drops pages from the main WebBoard if they aren't regularly updated.

At Charles E. Schwab & Co., Webmasters run programs that detect broken hyperlinks. And at TI, any sites joining the company's OpenAccess intranet site go through a technical review process, where things such as Common Gateway Interface scripts, which often harbor security holes, are carefully checked for vulnerabilities before they go online.

Kit Thomas, manager of financial systems and strategies at Schwab in San Francisco, puts the final touches on pages for FinWeb, the company's financial department site. But he doesn't actually verify the accuracy of a financial report; he relies on the authors to do that. "I review it and put my spin on it for usability and readability," he says.

Then there are those thorny political issues, such as just how much play a particular Web site gets on the corporate home page. Administrative issues such as these are more complicated than deciding among HTML or browser packages because they get personal. "We've had people saying they need a bigger icon on the home page," says Steve Wolf, manager of electronic communications at JCPenney Company, Inc. in Dallas.

Wolf and his organization quelled the issue by placing icons on the main page for the company's major depart-

ments, such as catalogs and merchandising, while placing bulleted text links to other sites, including "Online Reports" or "Developer's Corner."

"It cuts across all of the company," Wolf says. "But this hasn't satisfied everyone — we still get complaints."

Schwab's Webmaster did the same, arranging icons on the corporate home

page along business-unit lines. "People wanted a link to their page to be the first you would see," says Tom Voltz, Webmaster for Schwab's intranet, Schweb. "The design lays out the enterprise, plus it provides a way to get to all that data."

Real estate on the home page should not be the issue, however, maintains

Susan Weiner, a principal with Cognitive Communications, Inc., a New York-based Web design and strategic communications firm. "We try to educate departments to elevate their information to a level where people want to access it," Weiner says. "Most people aren't looking for things under the organization category," she says.

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"If someone puts up dumb or irrelevant information like a picture of his dog or something, he gets feedback from the [intranet] community to take it off."

Gene Phifer,
senior IT manager, T

Take McGraw-Hill Companies, Inc., which envisions its brand-new intranet as a way to flatten its organization, not to mirror it. "Our vision was to create communities of interest across different units and divisions," says Barbara Munder, senior vice president of corporate relations for the New York-based company.

Our policy on that?

Although it was one of the first universities in the country to offer students their own computer accounts, IU still has no firm intranet policy. "There is plenty of room for policy development," Ferencz says.

Most organizations already have in place or are now forming so-called "Communities of the Intranet" to establish policy and direction for the corporate Web. These communities comprise representatives from each organization with a stake in the intranet, from corporate communications to human resources to IT.

The issues can be dramatically different for noncommercial entities such as universities and nonprofit organizations. Take, for example, the American Heart Association (AHA), which is running a pilot intranet. The association is grappling with how to build and support an intranet that consists of a national headquarters as well as separate field offices staffed by employees and volunteers.

"Affiliate offices are independently incorporated," says Ann Nurre, an IT consultant with the AHA in Dallas. "We can't dictate that they run any particular version of Windows or other tools."

JCPenney's Loss and Prevention organization is tracking and reviewing policies for its jWeb intranet. The main policy is to make sure an employee does not inadvertently speak on behalf of JCPenney when posting something in a newsgroup or sitting in on a chat room because each transaction leaves behind the "@jcpenney.com" calling card.

Most intranets offer links to the public Internet, and even to business partners and suppliers. Most of these links are one-way connections, with a firewall sitting at the door to monitor incoming traffic. But it's not the outside 'Net connections that worry most intranet administrators — it's the prospect of an inside job, which is by far the most

prevalent type of security breach.

Each department's site deals with its own password or authentication measures. Some departments just shut out the Internet. Schwab's FinWeb has no links to the Internet, but that's not for security reasons. "Our only link is back to Schweb. We spent a lot of time and money, and it doesn't make sense to put

in a link that takes users away from the site," Thomas says.

One way to monitor misuse of the intranet is to track traffic patterns. JCPenney's Wolf says the company's IS department publishes a list of the top 10 sites visited by employees. "If USA Today is the No. 1 site, then a red flag goes up," he says.

TI's Phifer says it's not worth policing sites hogging a few megabytes of disk space with elaborate graphics. "Typically," he says, "the users of that Web site will give the site feedback if it takes too long to paint their screen." ☹

Jackson Higgins is a freelance writer in Stanardsville, Va.

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E-MAIL *here* WHAT'S A COMPANY TO DO? *there*

BY JON WILLIAM TOIGO

The rise of intranets within companies that have established E-mail infrastructures leads to a curious dilemma: Browser-based messaging can boost the usefulness of corporate Web applications but cripple the effectiveness of existing E-mail systems.

If the existing E-mail system and the Web facility are not tightly linked — and they can't be with today's technology — the addressing of messages to destinations outside the originating system is difficult, attachments may not be delivered and confirmation of delivery often is unavailable.

So many companies have decided to retain their separate messaging systems for the time being. But they hope a solution that will tightly integrate Web technology with traditional corporate E-mail systems will come soon — they know it's only inevitable that these two corporate cornerstones will need to come together.

"Clearly, everyone wants to be connected to E-mail, but few companies are willing to rip out their proprietary E-mail systems in favor of intranet E-mail," says Mark Levitt, a research manager for electronic messaging at International Data Corp. (IDC), a market research firm in Framingham, Mass. "There are some companies that have decided to go with intranet products from Netscape Communications [Corp.] and others, but they tend to be small or medium-size companies distributed geographically — no power users."

Escalating problems

Keeping E-mail and intranets distinct will create problems that promise to get knottier over time.

Web browsers are becoming a pervasive part of users' work, so the inclination to rely on an E-mail application offered via that interface can be strong, even if it's not the corporate standard. When employees start using more than one application to send and receive company information, the potential exists for critical missives to be overlooked. Chalk it up to icon clutter, if you will.

Separateness is costly to maintain, too. Expenses will creep up if you need two groups of personnel to oversee two mail directories with two change-management processes to handle the addition, modification and deletion of users.

It's also more work. In the

absence of a standardized method for passing messages between the disparate E-mail infrastructures, Web-based applications that perform application-to-application or application-to-person messaging operations across mail boundaries must be developed with customized gateways. This adds to their complexity and makes code maintenance difficult.

Over time, the failure to integrate messaging capabilities may impair a company's ability to communicate with other businesses. So the challenge for IT professionals now is determining when and how much integration is desirable or strategic.

Analysts point to early efforts at desktop integration as an indicator of things to come. E-mail vendors such as Lotus Development Corp. with cc:Mail and Hewlett-Packard Co. with OpenMail already are preparing to deliver clients that will plug in to popular browsers, reducing icon clutter. But the question remains whether this level of integration will resolve the underlying problems of separate E-mail directories.

*Popular Web browsers
sporting easy-to-use E-mail
facilities are forcing companies
to rethink their corporate
messaging strategies.*

Industry experts agree that the major impediment to integration is the fear of making a strategic mistake. Joe Schneider, manager of the Web Common Operating Environment for one of the largest private networks in the world — HP's — understands the problem well.

The network, over which the intranet operates, handles more than 5 terabytes of messaging traffic per month, says Schneider, who works at HP in Fort Collins, Colo. E-mail and messaging, software distribution and information distribution utilizing the

intranet are the three major applications on the network, Schneider says.

In Schneider's view, the evolution of the HP intranet has been less a story of replacement and migration than one of coordination. "We use OpenMail as our messaging structure, but we have also used Lotus Notes for collaboration and for some other focused applications. Utilities from Microsoft [Corp.], Adobe [Systems, Inc.] and Netscape Communications Corp. have been brought in to help develop certain Web applications."

While coordinated, Schneider says the lack of integration among networked information inputs to users is disconcerting. "There are too many entries



program interfaces to deliver the forms via E-mail to end users. These mail-enabled applications will eventually provide real business value to the company," McGlynn says.

Webster must be tightly integrated with the corporate messaging backbone to fully realize the intranet's potential, she says.

That will take some doing. "We made no cognitive effort initially to integrate our intranet with the corporate messaging system. E-mail was just rolling out as we started to explore intranet technology," McGlynn says. "Today, E-mail is considered business-critical and receives higher priority through company routers than does intranet traffic," she

explains. "Over time, intranets will become business-critical, and we will need to build on top of the E-mail system, leverage what we have, to make the most of Web applications."

A glimpse of the future

Cargill is not taking a laissez-faire attitude toward the future require-

"Companies should establish standards for intranet application and application-to-user messaging to add predictability and stability to system messaging."

Klio McGlynn,
intranet consultant, Cargill

ments for integration between the company's corporate messaging system and intranet, McGlynn emphasizes. In fact, it's being rather aggressive.

Cargill and HP are codeveloping what will be one of the industry's first integration solutions, called Common Message Transfer Services (CMTS). From an integration perspective, CMTS is an infrastructure that facilitates the movement of messages between business applications.

For HP, CMTS is the beginning of a framework, called SwitchWare, that will provide a common infrastructure for the transport of messaging and data traffic, says Nigel Upton, a worldwide marketing manager at HP. "It provides a standard way for applications to talk to the transport system, allowing Web-based applications, client/server applications, legacy applications and others to use the corporate messaging system."

The development efforts with Cargill will produce a product for use with OpenMail messaging systems exclusively. However, as object-oriented technologies are added to CMTS, "it will broaden into a framework that can use other messaging transports such as Microsoft Exchange. The goal is one transport system for person-to-person as well as interapplication messaging," Upton explains.

CMTS is in pilot now, providing an elegant way for Cargill to link applications to the OpenMail backbone for messaging. Cargill expects to wrap up the pilot this month and move CMTS into production later this year.

HP's SwitchWare will be available by third quarter this year. It will be the first commercial messaging middle-layer product to form a multi-system solution designed to unify applications and networks of global information.

For the companies that prefer a single solution, integrating technologies will be required for intranet-based applications to provide powerful business and operations solutions, including financial processing, but ultimately work the same way as if they were talking the old way.

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In late 1990, the Internet Engineering Task Force (IETF) initiated efforts to select a successor to the IP. In late 1993, the IETF formed the Internet Protocol — Next Generation (IPng) working group, which was chartered with investigating the various proposals, and recommending a course of action. The outcome of those efforts produced what is now known as IP version 6 (IPv6), which is currently being implemented by many vendors.

Perhaps more importantly, IP is the foundation of the TCP/IP protocol suite. Therefore if IP is revised, other protocols must be changed as well. The significance of this protocol revision extends to LANs, MAN and WAN transmission systems, as well as the upper layer protocols and application programming interfaces.

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SNMP (Simple Network Management Protocol) has become the de facto standard for end-to-end enterprise network management. Recent enhancements to the SNMP-based technology, including SNMPv2, RMON2 and Web-based management tools, improve this popular system. With those enhancements, however, come additional challenges for the network manager.

This one-day, information-packed seminar, taught by internetworking expert Mark Miller, will help you understand the elements of an SNMP-based network management system, how to implement SNMP with your internetwork, plus the various enhancements such as the new message formats and improved error codes provided with SNMP version 2. You will learn about recent enhancements to the Remote Monitoring (RMON) network management architecture, known as RMON2, and the advantages of implementing RMON throughout your internetwork. In addition, you will see how SNMP is being used to manage broadband networks, including frame relay, SMDs and ATM.

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6. Discover how existing Web-based enterprise managers and existing SNMP-based devices can be integrated into a cohesive system
7. Understand the enhancements found in SNMPv2, plus the proposed security enhancements: SNMPv2s and SNMPv2*
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INTERVIEW

thing is going to emerge from putting the tools into people's hands. But that is certainly not the most effective way to get that impact.

As an aside here on ROI, do you think people talk about it more than actually do it?

Absolutely. Because when you begin to ask in companies, 'What is your methodology for measuring ROI?', or any kind of value, people typically are saying, 'It's too early. We've just done it this year,' or 'We've just done it last year.'

In terms of the costs you mentioned before, is there any one area that holds more surprises than another?

It all adds up. The costs may not be visible initially because they may be supported by different parts of the organization. So IT may own the infrastructure and the network and the security, and content may be coming from corporate communications or from marketing. But when you put it all together it's significant. You see that you've actually begun to devote quite a large number of resources to this intranet that was created to save money. And so, then you get back to that question: 'Well, is there a longer term value? Is there a more strategic value beyond the initial cost savings?'

Is this diversity of involvement typical of intranet development?

I see lots of intranets that are spearheaded by marketing, by corporate communications, by people in different roles within the company. Often the content part is pretty obvious initially and can be done quite independent of MIS. But eventually they need MIS to figure out how to get it onto people's desktops and how to make access work.

But I think it's unfortunate for that to be the only stage of engagement for MIS, because then that becomes just another kind of support function and [MIS doesn't] have any of the strategic role of looking at those bigger questions of what this intranet is really supposed to do for the organization.

You opened by saying intranet experiences seem to be mirroring Internet developments, but you say that as if the two have nothing to do with each other. Is that what you're seeing?

The worst case is where there is duplication of effort. So here's one group developing

content for the public Web and another group developing content for the intranet. Maybe it could be and should be the same content up to a certain point, but they're working on it in a redundant way.

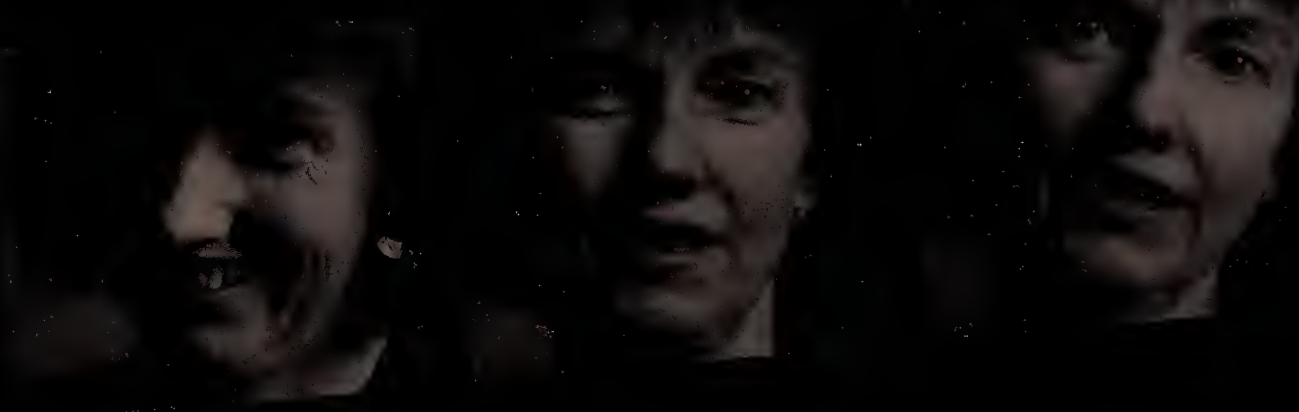
Companies are starting to understand that's a major problem, so we see more integration, at least at the content level. People are at least channeling the same information internally as is going out on the public Web.

But it's that next step that is often missing — figuring out how, for example, to redesign the customer support relationship to get customers to happily do certain kinds of self-support like checking inventory status or work status.

What are the typical types of things we're talking about here?

Well, for example, gaining flexibility in configuring a product upfront so it matches exactly what they are looking for. And then being able to really see the progress of that product through the whole system, up to delivery and, in some cases, through payment.

Those kind of functions are coming, and that should have a huge impact on streamlining all sorts of internal processes. And it should really rely on effective delivery of information to the



desktop via the intranet. That kind of architecture, and that kind of thinking about the whole work flow, is at a higher level than what most companies are engaging in today.

The ultimate goal is to gain an advantage over the marketplace. If all your efforts are just internal and don't ever translate into an advantage in the marketplace, then it doesn't matter how much cost savings you can demonstrate. You have to be able to turn that around into growth externally.

Is it possible to classify where companies stand today in terms of integrating their intranets with other Web activities?

I think the bulk of the companies are still in the 'Look, we've got an intranet' stage, just the way they were a year ago with 'Look, we've got a Web site.' They're still in the initial deployment.

And then there are a number of companies that have been through that deployment and are questioning where the real value is. And then there are a few companies, the leaders, that are saying, 'How do we integrate all this? How do we begin to change the dynamic of how we do business and get a real advantage from the investment in both the intranet and the public Web?'

How do you get from one stage to the other? Are these stages that require significant investments?

I think you can get there faster, certainly, if you start with the approach that this is not a separate undertaking. Deploying an intranet should be part of your electronic commerce strategy.

And you should really, at the beginning, think about how this can be integrated with everything you're going to do with the Internet, and how the Internet is opening up opportunities in your industry for new relationships, new products, new channels. If you can begin with that big picture, then what you're doing internally in deploying an intranet can be more effective.

We have all heard about successful intranet projects. Do you have any horror stories about nets that failed outright or just fizzled?

I haven't seen any company that built one and then just walked away from it, because usually there's enough enthusiasm and a few champions in various divisions to see it through. And one of the significant advantages to intranets is people can do amazing things in their own arena.

So you can have a marketing person or someone in a library get their hands on a server that's part of an intranet and put really good stuff in, because they personally see the point and they personally want to put the time in.

And often, that generates momentum and results, at least around that particular department or that application. So part of it is that it opens up that opportunity.

And in big companies I hear that again and again. They say, 'Well, we thought we had channels for people to communicate. We had an internal system, we had whatever already in place. But somehow, when we opened up the opportunity for people to really put things directly onto the Web, a whole new level of communication started to happen.'

And that's interesting, and that's perceived in most companies as being very positive, both by the people who share the information and by the people who then see that, yeah, there's all sorts of opportunities for using it.

So I haven't seen anyone yet who said it's a total failure. I've seen a lot of people starting to say just what we started with here — having lots and lots of information online may not be the point anymore. The point is to highlight the items that make a change or make a difference. ☺

from marketing. But when you put it all together it's significant. You see that you've begun to devote quite a large number of resources

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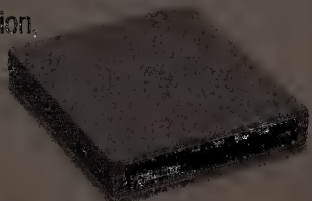
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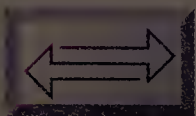
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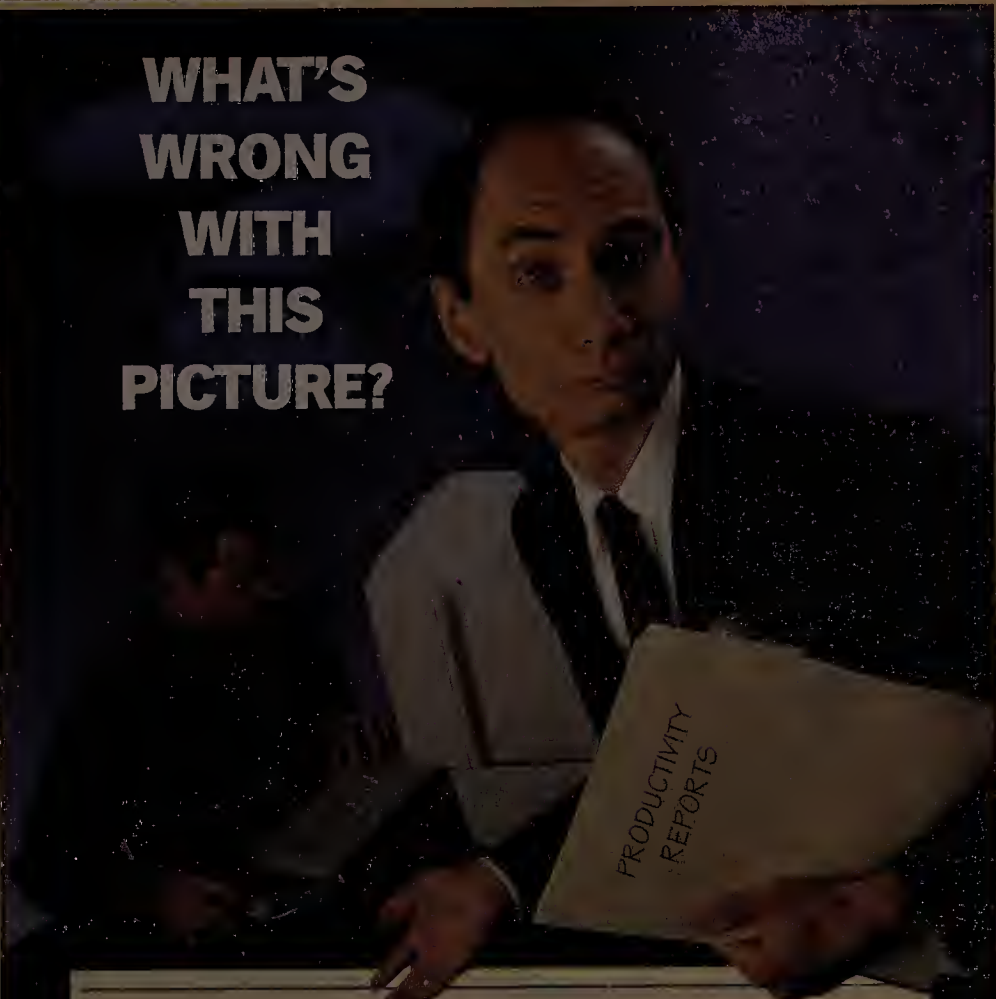
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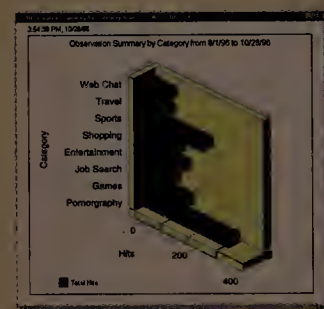
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WE B W A R E S

Close enough for rock and roll



My two brothers-in-law, Brennen and Quinn, are good musicians. Brennen is a guitarist and Quinn a drummer. One evening, at the end of a long jam session with a few friends, things got a little out of hand — musically.

"Dude," (common lingo in southern California) Quinn says to Brennen, "you're off-key."

"Who cares, dude," Brennen replies. "It's close enough for rock and roll."

Now, what do the musings of my wife's grunge-playing brothers have to do with intranets?

Let me explain.

I think information technology in general and software in particular have let us down because they have done little to improve our understanding of our businesses. Sure, at times we've implemented some great solutions for improving specific corporate business processes and addressing personal productivity issues. But these solutions haven't told us much about how we do whatever it is our businesses do.

Groupware comes to mind. When groupware became a hot topic, I believed in it. It seemed logical and plausible that groupware could and would address the thorny issues related to managing an organization's communications flow. More than that, I assumed groupware would capture an enterprise's knowledge.

As it turns out, this view was merely rose-tinted optimism. It soon became apparent that groupware generally fell into one of two categories: systems that knew exactly how a company should run its business or systems that required a company to know how its business operated so it could tailor its business model to a provided framework.

The former strategy — the "you will do zinks our way" model — gained popularity for a time. Products such as Coordinator from Action Technologies, Inc. took this to an

extreme. With Coordinator, every transaction between people was structured according to an academically inspired view of how they should communicate — it was a real pain to use.

The latter strategy (the "kit of parts" approach) is still popular. Lotus Development Corp.'s Notes best exemplifies this subgenre.

Now don't get me wrong: Notes is a fine product — that is, as long as you're committed to it 100%. The implementation and maintenance costs are high, and few organizations are willing or capable of making the required commitment to get a real payoff.

Recall, if you can, the study MIT's Sloan School of Management conducted a few years back on Price Waterhouse's use of Notes. Professor Wanda Orlikowski turned up the surprising finding that Price Waterhouse overwhelmingly used Notes as a bulletin board system (BBS) and for E-mail. Given that the firm initially paid approximately \$250 per seat for Notes,

this was a mighty pricey BBS and E-mail service.

This finding speaks volumes against the framework approach to groupware. If a serious consultancy such as Price Waterhouse wound up using Notes mainly for non-groupware services, what hope do other, less savvy, companies have?

Once again, and before the Notes PR people come after me en masse, I really do think Notes is a great product. My point is that Notes is not a general solution, but is great for well-understood business processes.

Notes' problem lies in the technology itself and the people deploying it. Generally speaking, due to the richness of the technology, Notes does too much to make implementation easy, while those deploying Notes know too little about how to use it to embody more than a fraction of their business processes.

Intranets are the opposite of these groupware approaches.

Rather than being great for well-defined data handling, intranets

are terrific for collecting the intelligence of an organization in a flexible, free-form, low-overhead manner. They don't rigidly define what data is acceptable or constrain access by offering a small range of reporting options. Intranets are, in fact, about as general as corporate information handling can be.

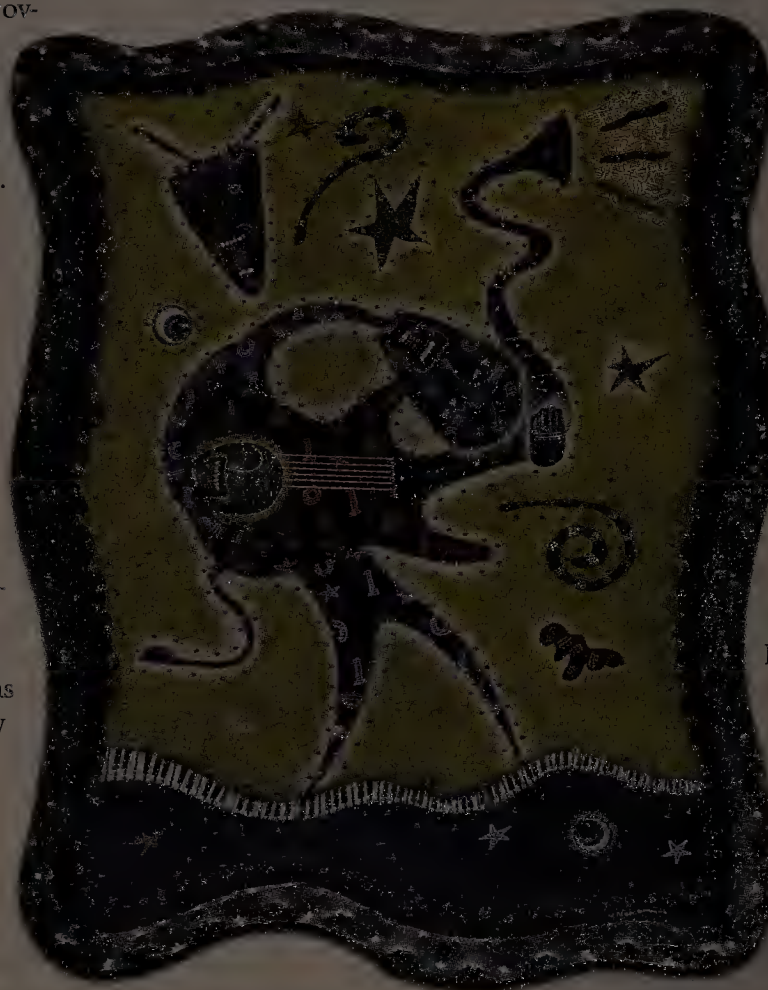
So, for the purposes of understanding how an organization functions and what data and information it possesses, intranets are close enough to provide a useful, pragmatic and simple way of acquiring, storing and retrieving the informational stuff on which an enterprise runs. Because such a diverse range of data is easily available, you can now look for details of corporate operation that are simply not captured by groupware's limited scope.

The rise of intranets is forcing recognition of the existence of a whole universe of corporate data that the IT group will never understand or control in an in-depth sense. The IT group can't expect to understand something such as a chemist's report that doesn't have a

set layout and to which the author might attach diagrams, embed spreadsheets and so on. Once IT admits this, it can concentrate on providing services to better support users rather than just providing services to support the organization.

So the next time someone in your company dismisses intranets as not being serious enough for the organization's data, information and knowledge acquisition and retrieval purposes, just point out that no other tool can deliver the way an intranet can at such a low cost. Sure, an intranet is not going to give a perfect result, but nothing else even comes close. And, as Brennen would say, that imperfect result is good enough for rock and roll.

Grunge, punk or drum and bass? Let me know your musical inclinations by dropping me a line at mgibbs@gibbs.com or calling (800) 622-1108, Ext. 504.



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Technology Update

Keeping Up with Network Technologies and Standards

NETWORK HELP DESK

Ron Nutter, a Master Certified Novell Engineer and Groupware CNE in the Lexington, Ky., area, tracks down the answers to your questions. Call (800) 622-1108, Ext. 476, or send your questions to rnutter@world.std.com.

I am running NetWare 3.12 on five file servers, with CPUs on the servers ranging from a 486DX33 to a Pentium 166. The servers connect to two LAN switches and run RSPX and remote protocols so I can access them via Rconsole.

Almost every time I go to Rconsole to access my servers, one or more of the slower machines is omitted from the list. Rconsole, which I've updated with the latest patches, appears to be even more selective about which servers are shown if it is run from a DOS prompt within Windows 3.11.

What can I do to make sure all my servers come up on the list?

Via the Internet

I can think of a few reasons why this might be happening. If your network cards haven't been updated for at least a year, they might be part of the problem. Make sure you have the latest LAN drivers.

Also, make sure the slower servers have at least 60% available cache buffers. Low memory in this pool may cause the servers not to appear consistently.

The problem might reside at the workstation because you seem to have more of a problem with servers not appearing when Rconsole is run inside Windows 3.11. You could try installing the latest virtual loadable module client software or move to Client 32 for DOS/Windows. The latter option could address the Rconsole problem and give you more conventional memory.

This problem also could crop up if there's a bus timing issue between the network cards and the computer from which you're running Rconsole. When a server disappears from the Rconsole list, see if it is still shown on Slist. If the server isn't in the list, try the Display Servers command at the file server colon prompt to see if the server nearest you sees the server. There might be a timing problem at the switches if the server doesn't appear at that point.

Server switching: A new way to network servers

By Selina Lo

Network performance is often assessed by the speed at which information can be accessed from servers, yet switching solutions have traditionally focused on desktop and backbone requirements.

The switched internetwork model, in which servers are treated simply as end nodes on a backbone switch, doesn't scale for environments in which enterprise applications are distributed across many servers. Such environments call for the development of a new breed of Layer 2 switch — let's call it a server switch — designed specifically for interconnecting servers supporting common applications.

In conjunction with server adapters and host-specific optimization software, server switches provide a cohesive server system to meet stringent performance, scalability and resilience requirements of multiserver applications.

A server switching system, for example, minimizes the number of packets servers have to process and off-loads host-processing functions to the server switch or adapter whenever possible.

Network overhead on a server consists of network interrupt handling, protocol header processing and data copies. Today's adapters interrupt the host on every received packet to minimize network latency. This can potentially consume all available server cycles when traffic floods a high-speed connection. A sustained burst from a Fast Ethernet link, for example, can blast a server with 100,000 packets per second. A high-speed server adapter must be able to consolidate host interrupts when packets are received continuously.

An intelligent adapter can off-load CPU-intensive functions from the host protocol stack to the adapter hardware. By depositing incoming packets into memory locations aligned for application access, the adapter

can relieve the server of data copy operations.

On the switch side, a server switch can automatically block irrelevant broadcast traffic from a server to eliminate the associated interrupt and packet-discard handling. Together, the switch and adapter can cut down on the number of packets the server must process.

The 1,500-byte maximum Ethernet frame size is inefficient for large transfers over high-speed Ethernet LANs. To illus-

trate, data kept on the server adapter, the server switch can even direct network traffic to load-sharing servers based on real-time availability of server cycles.

The coupling of server adapters and switches also offers opportunities for integrating system and network management. By combining the use of SNMP and the Desktop Management Interface, applications can obtain information on the network, server switches, adapters and servers. This can be used to pin-

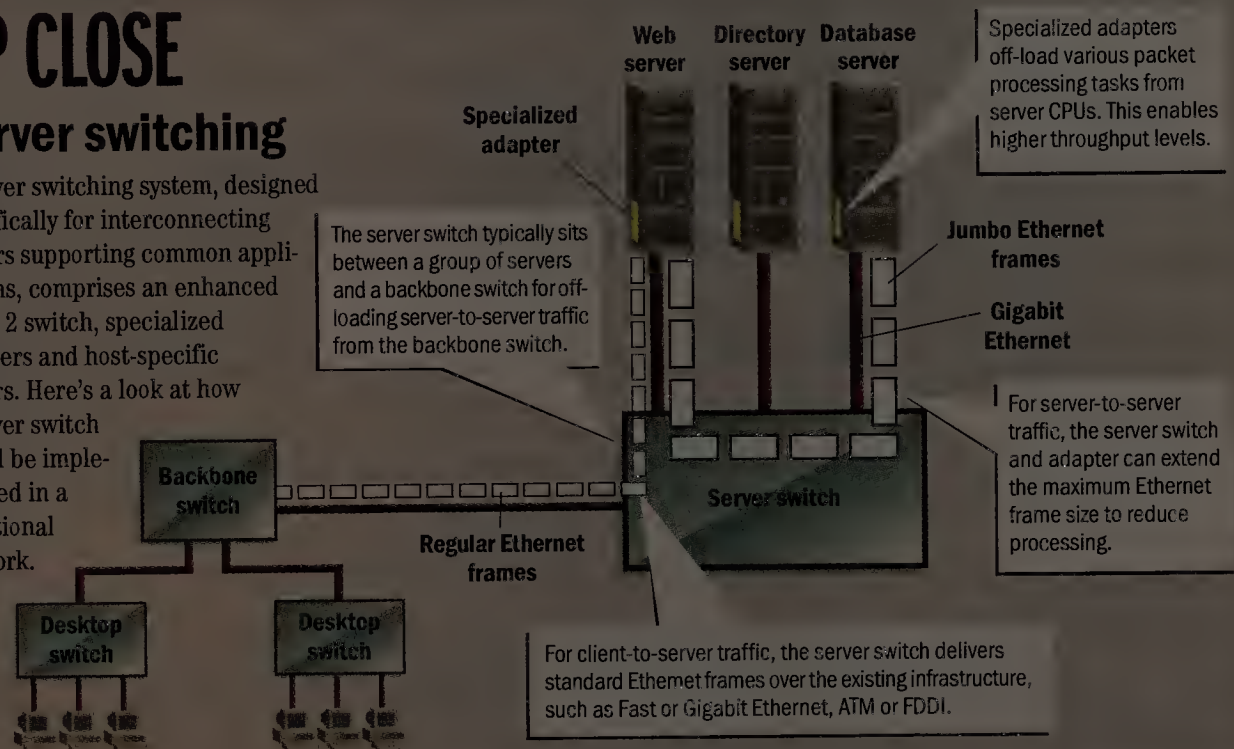
point network problems or performance bottlenecks, and provides cohesive management for server farms.

Multiserver applications generate server-to-server traffic that consist of long, continuous streams of maximum-size frames or short, bursty, time-sensitive control messages such as heartbeats and remote procedure calls. Mixing server-to-server traffic with the steady flow of aggregated client-to-server traffic on the same backbone can cause sporadic response time degradation.

Network managers have worked around the issue by creating separate backbone LANs that only transport interserver traffic. An alternative is to connect the server switch, instead of each server, directly to the cam-

UP CLOSE Server switching

A server switching system, designed specifically for interconnecting servers supporting common applications, comprises an enhanced Layer 2 switch, specialized adapters and host-specific drivers. Here's a look at how a server switch would be implemented in a traditional network.



trate, a 1G-byte file transfer on a Fast Ethernet link requires the servers on both ends to process 8,000 packets per second for 85 seconds. A cooperating server switch and adapter can reduce this by extending the maximum frame size between themselves, while using standard frame sizes when the servers communicate with external Ethernet devices.

What's more, a server switching system provides a way to network server farms using standard technology.

By providing a virtual IP address to the external network, the server switch can make a load-sharing server farm transparent to users and applications. Servers can be added dynamically to the farm, based on network load or removed in real-time for maintenance. With

point network problems or performance bottlenecks, and provides cohesive management for server farms.

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Network managers have worked around the issue by creating separate backbone LANs that only transport interserver traffic. An alternative is to connect the server switch, instead of each server, directly to the cam-

pus backbone. Server-to-server traffic will remain within the server switch while client-to-server traffic is forwarded to the campus backbone.

The server switch can support classes of service to minimize interference among different types of server traffic. Interserver control traffic can be given the highest priority, client-to-server the next, and bulk transfers between servers the lowest.

Within a server switching system, server adapters can be dual-homed to redundant server switches to provide a hot-standby path from the server to the network. The dual-homed adapters can offer only one set of virtual addresses to the network so that, in the event of a failure detection, failover can be transparent to the users and applications.

In addition to network failures, mission-critical servers also must be protected from unauthorized access. Server-specific firewalls can be placed on the server switch instead of the backbone to avoid slowing it down for the entire organization.

Lo is vice president of products and marketing at Alteon Networks, Inc. in San Jose, Calif. She can be reached at (408) 360-5528 or at slo@alteon.com.



And the winner of the telecom free-for-all is...

Even after the billions of words written about telecom reform, it's not clear which players will emerge as big winners.

The current contenders would have you believe the winners, at least in the business arena, will be the providers that put together the best packages of services—local, long distance, international and Net—with the best pricing on a single bill.

But that opinion doesn't hold. Customers aren't talking to me about one-stop shopping.

They're talking about a profound shift in network architecture—a shift toward *embracing the Internet as the foundation of their WANs*—for data now and for voice and other traffic as soon as they can.

The significance of this shift can't be overstated. Embracing the Internet as the WAN architecture obliterates long-standing boundaries between local and long-distance service. It shifts the competitive landscape among the players, cancelling out or amplifying strengths and weaknesses.

In a discussion with *Network World* editors this week, five Boston-area net managers said the primary challenge they face is moving to the Internet as the corporate backbone. They represented a large bank, a leading publisher, a state agency, a systems integrator and a vendor—a diverse set of companies with a single vision of the Internet as the backbone network.

Why? Because the Internet would provide a way to more easily link up to business partners, end users and remote sites. It would minimize capital expenditures and upgrade headaches, and reduce costs.

Certainly, security and reliability concerns exist. But the customers I spoke to last week, and others, say those issues will be—must be—overcome because the Internet imperative is clear to them.

One of the executives likened this on-or-in-a-generation shift to the migration of voice traffic from private nets to carrier-supplied virtual private networks in the 80s. Only the Internet-based virtual networks these net managers want will span the globe, carry multimedia traffic and reach every other company.

Unfortunately, the companies waging the telecom wars today aren't on the same wavelength. Their mindset is piece-part technologies (cable modem vs. digital subscriber line), global consortia or packaging of discrete services such as frame relay and Internet access.

Not one of the vendors I've spoken with has outlined the same vision that customers are outlining. Vendors are emphasizing their strengths in traditional areas and missing the fact that the ground is opening up beneath them.

So, who's going to win the telecom free-for-all? Simple. Whoever recognizes this Internet imperative most quickly.

John Gallant, editor in chief

jgallant@nw.com

Wide-area Networking • Kumar Shah

Time to sound a battle cry: I want my frame relay SVCs

You are being cheated out of the promise of frame relay for WAN transmission by vendors that put all their eggs in the ATM basket.

Rather than waiting quietly for ATM services, you should demand that vendors deliver equipment that supports frame relay switched virtual circuits (SVC). Only such equipment can provide the flexible, end-to-end connectivity of telephone networks—which can be audited and billed based on usage—coupled with dynamic, on-demand connectivity of LANs.

Carriers are as much victims of the vendor paralysis as users are. Over the past 18 months, all the regional Bell operating companies have announced plans to offer SVC or usage-based service, but have been unable to follow through on their promises because vendors have failed to deliver the necessary equipment.

In the meantime, AT&T has announced its intention to provide ATM SVCs. This is good for the industry because, when delivered, they will give you more flexibility in data call setup along with usage-based billing.

However, few enterprises currently have ATM access equipment installed, and ATM's 155M bit/sec throughput is still too expensive for most to justify. It seems to be a case of the cart before the horse, because carriers are expected to generate \$8.1 billion in revenue from frame relay services by 1999, compared with less than \$500 million from ATM services, according to Vertical Systems Group's "1996 ATM & Frame Relay Industry Update."

This is an issue of vendors putting too much emphasis on their future ATM strategies, rather than investing in technologies they could deliver today.

Frame relay SVCs have no external impediments. Standards are in place today—from the Frame Relay Forum and the Internet Engineering Task Force—to ensure consistent implementation of SVCs in access devices.

Frame relay SVC services would cost a fraction of your current WAN expenditures. Carriers could achieve an 80% reduction in operational costs because the moves and changes associated with traditional permanent virtual circuits (PVCs) would be eliminated.

By demanding that equipment vendors support frame relay SVCs, you can protect your investments in frame relay access equipment.

And you can realize the benefits of the flexible, direct connectivity of SVCs, including value-added managed services such as managed SNA, transparent LAN services and Internet/intranet services.

In addition, you could further reduce costs by paying only for actual bandwidth usage, as opposed to the committed information rate and committed burst rate billing in place for static PVC architectures. Furthermore, frame relay SVCs would provide you with a better solution for many emerging requirements, including direct end-to-end LAN connectivity to support new applications such as internal Web pages and desktop conferencing. SVCs would also provide cost-effective and flexible access to remote sites, as well as direct circuits that carry voice and video to provide a high-performance, cost-effective solution.

No technology widely deployed today can provide these value-added services enterprises require to make the most of their network investments.

ATM can't do it today. Neither can leased lines or traditional frame relay PVC architectures.

Without frame relay SVCs, network managers are faced with a choice between making do with their static frame relay networks or making costly up-grades with the hope that ATM will be a real alternative.

It's time for you to take control of your WAN costs and capabilities. All the elements are in place for vendors to provide the necessary standardized technology to make SVCs a reality.

Shah is a senior marketing director at Hughes Network Systems, Inc., a worldwide supplier of global networks headquartered in Germantown, Md. He can be reached at (301) 601-4057 or via the Internet at knshah@hns.com.

MESSAGE

Send letters to nwnews@nw.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

Leave copyrights alone

Regarding your political position on the extension of copyrights to corporate databases in "A call to action" (March 31, page 1):

You seem to have bought into the myth that corporate data and information take on a new, noncopyrightable property when posted online. In fact, the federal copyright laws specifically states that original works are covered by a copyright "in any tangible medium... now known or later developed" (17 U.S. Code Sec. 102).

Thus, a specific law extending copyrights to corporate databases would represent brand-new law. Furthermore, it

There's something almost cozy about an old, familiar fear. For instance, the fear that your network will blow up or technology will pass you by. We've had to deal with these fears for so long that we feel, "Been there, done that."

We're in a period of major merger and acquisition activity, so it's reasonable to ask whether that sort of event could hurt your network. Many users whose vendors were acquired by other companies have felt the new owners changed directions.

When your vendor is bought out, how do you decide whether to stay the course or change vendors?

Another good test is whether the product you use is one that competes with the acquiring vendor's own line. If it does, then ask yourself objectively whether your vendor's product line is the better of the two.

Another good indication of whether a merger will change product strategy is the level of detail the acquiring company provides on its plans for assimilating the other firm's product line. For example, when Newbridge Networks, Inc. acquired UB Networks, Inc., Newbridge laid out a detailed consolidation strategy and identified the product to be phased out: UB's GeoSwitch. Newbridge moved to convert GeoSwitch



What do you do when you apply these criteria to the merger or acquisition involving your vendor and it fails?

First, make noise immediately. Mergers and acquisitions are in the news and so are problems and concerns that arise out of them. While the bright light of media coverage is shining on your vendor, it will be a lot more likely to pay attention. Call the vendor and demand answers. If you don't get them, call the press.

This fee can be high, and the charge is rarely applied to equipment that is still part of the vendor's product line. For equipment being phased out, the charge can be a nice way for the vendor to push you off maintenance or out of the product altogether.

In any case, be aware that many service contracts don't guarantee renewability. If you're not happy with your contract, you may want to seek third-party maintenance options that give you better protection.

Third, phase out of your network gear that's going to be phased out of the vendor's product line.

When the vendor won't comment on the future of the product, or when you don't believe what the company says, look at the question of near-term utility. Just because a product won't be available in the future doesn't make it useless in the present. In most cases, you're better off using the product as long as you can get support for it and it meets your needs. Eventually, you may find that traffic changes or application requirements force you to make network changes that an obsolete product won't accommodate. Then you'll have to move on to something else.

Fearing change, especially high-level changes in product direction, is natural. The key is to reduce risk responsibly, so good decisions in the past aren't compromised by every business merger or buyout that comes along.

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Brian Youngerman
Editor
"The Sports Bar" sports newsletter
Prospect Park, Pa.

The disturbing part of the Clinton administration's new

Network World
Fusion
www.nwfusion.com

To be a credible system, the obtaining of keys from escrow must require the same level of proof that obtaining a search warrant requires. It must be proven to a judge that there is sufficient cause to obtain the key. A credible control of access to keys in escrow still allows for quick access while fostering public confidence.

I disagree with RSA Data Security, Inc. President Jim Bidzos' claim that the government "plans to severely limit

There is no evidence that key escrow will severely reduce the number of products. If the market is there, the products will be available.

Michael Scholnick
President
Clay Pigeon Technologies, Inc.
Baldwin, N.Y.

In your article on IP address management (March 31, page 20), Isotro Network Management, Inc. President Rod Anderson is quoted as saying, "You've lost the ability with [Dynamic Host Configuration Protocol] to assure or guarantee the association of an IP address with a user."

Since mistyped IP addresses

Matthew Leeds
Technical Services Manager
Broderbund Software, Inc.
Novato, Calif.

T e l e t o o n s



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Named Editors' Choice Internet Service Provider 1995, *PC Magazine*.

Founding Organizational Member of the Internet Society.

References:

Thirty-seven of the Fortune 100 companies, as well as thousands of forward-thinking medium and small companies, including: American Airlines, American Medical Management, Austin International, KP Group and SkyTel.

Hobbies:

Street hockey. Softball. Surfing the Net. Chess.

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WEB-BASED MANAGEMENT:

A recipe for success

By Theo Forbath

We'll soon find out how well vendors learn from past mistakes. A case in point: World-Wide Web-based network management. The promise is that Web technology will solve some long-standing net management problems, such as lack of integration and alert correlation, support for multiple operating systems and a universal interface, to name a few.

Can Web technology meet all these challenges? No, at least not on its own. But if vendors have learned from past mistakes and are willing to put customers first, it can go a long way toward helping realize that promise. If vendors haven't learned, we'll see another chapter in the ongoing network management saga that has seen the demise of high-profile efforts such as the Open Software Foundation, Inc.'s Distributed Management Environment and the Management Integration Consortium's attempt at management application integration.

If Web-based management is to realize its promise, vendors will have to rally around a limited set of standards, putting an end to wars that pit one group against another. They will have to focus their efforts, using Web technology only for those chores that cannot be handled with existing standards, specifically SNMP. And vendors will have to look to leverage technology being developed in other Web-related areas, such as the security innovations coming out of the electronic commerce arena.

These are the cornerstones of our recipe for success, which we offer in the hope that vendors will take notice and not be doomed to repeat past mistakes.

What's to be gained

Failure this time would be tragic because the Web brings a lot to the net management table.

As all vendors of Web-based management products happily will tell you, their products offer anytime/anywhere management that is cheap, ubiquitous and



Guidelines to help realize the promise of Web technology in net management tools.

doesn't force you to choose one user interface or invest in an all-encompassing platform or framework.

Furthermore, Web tools overcome some limitations of SNMP in supporting real-time configuration changes to network and system elements. Automating and simplifying remote configuration for all kinds of devices, even desktops, is one area in which Web-based management efforts are already improving the state of enterprise management.

International Network Services (INS), a network integration and management services firm in Sunnyvale, Calif., provides an example of the Web's

potential. Its EnterprisePRO (EPro) monitoring service uses Web-based software, including a browser that acts as the window to various element managers, says Steve Walbuster, the firm's principal architect.

For example, if EPro determines a WAN link is dropping packets from a specific Cisco Systems, Inc. router port, EPro will forge a link into Cisco's Web interface to the router, which in turn allows an operator to diagnose the dropped packet problem and adjust buffer allocation tables. Without the use of Web technologies and standards, this process would require an expensive integration effort with an enterprise framework and extensive operator training.

Indeed, the Web offers substantial savings to users and vendors involved in custom development and integration efforts. Most management software developers will tell you huge savings can be had in developing one platform-independent, Web-based management tool, as opposed to porting applications to 11 flavors of Unix and integrating them with four or five proprietary platforms or frameworks. Web-based technology should allow vendors to apply more engineering resources to solve management problems.

Perhaps the biggest win for users of Web-based management tools will be a lower cost of ownership.

Consider training. Most large enterprises train one to four console operators to become management gurus. They are the only ones who can use the enterprise console, interpret management information and perform near

real-time analysis. Web-based tools will require far less training.

These tools should also take a fraction of the time to deploy, configure and integrate compared with current enterprise-scale management tools. Given that ease of adoption is one of the biggest challenges faced by vendors and users implementing enterprisewide management solutions, this presents a real opportunity.

Users also could benefit from new pricing models

Turner effort shows promise and problems

By Michael Csenger

Nearly two years ago, when Web tools were for browsing and nothing else, Charles Hebert led a team of developers that wrote Web-based network monitoring applications for Turner Broadcasting Systems, Inc. in Atlanta. His experiences since then demonstrate the power of the World-Wide Web for network monitoring and its limitations for more complicated management chores.

Dubbed Health Monitor, the system is based on Hewlett-Packard Co.'s OpenView platform. It integrates Java and several other technologies to provide real-time network monitoring via Web browsers.

The system worked so well that Time-Warner, Inc., which has since acquired Turner, took notice of Health Monitor and decided to bring the same capabilities to its own network operations suite. Hebert and several other Turner members formed their own company, Atlanta-based Southernview Technologies, Inc., to pursue Web-based net management implementations for Time-Warner, Turner and other clients.

Hebert says browser-based management tools provide excellent monitoring capabilities, but will not supplant the more hands-on configuration and troubleshooting powers of a network management platform. "Web tools make a good monitor of monitors, not a manager of managers," he says.

Turner and Time-Warner have discussed taking Web browsers further, using them as a standard interface to all net management functions. "But there's really no good reason for it," Hebert says. "What we have now already solves the problem that it's meant to: It gives people all the network monitoring access they want at very low cost and from wherever they happen to be."

Hebert cautions those looking to develop their own Web-based monitoring tools to watch for two common snags. "The first thing you find is that not all Java is the same," he says. Different platforms — Unix, Windows, Macintosh — support slightly different Java flavors and must be accommodated by carefully scripted code.

"But the real crux of these projects is that there's no common, standard way of storing and grabbing management data," Hebert says.

OpenView, for example, uses its proprietary database. Writing Java applications that act as intermediaries between a browser and the OpenView database is far too difficult, Hebert says, in part because OpenView doesn't support SQL.

Instead, Hebert recommends that Java applications use an intermediate database to organize and correlate management data so it is easier to handle. Hebert has successfully used Seagate Technology, Inc.'s NerveCenter for this purpose. "You still have to be able to tell it what to look for, and that's the challenge. But this way, at least Java has a handle on something, and you can readily get at it through a browser."

Csenger is a freelance writer in the Chicago area. He can be reached via the Internet at mcsenger@mc.net.

vendors may be forced to adopt. Most enterprise management applications are licensed on a per-seat basis. With Web-based applications deployed throughout the enterprise, vendors will have to seriously consider shifting their pricing strategies to a per-server model that allows for more widespread use of management tools.

Ideally, the Web will make management data accessible to everyone in the IT organization, allowing people to make more informed decisions. Already a number of enterprises use Web-based performance reporting tools from companies such as Kaspia Systems, Inc. and INS to keep users and line-of-business managers abreast of IT service levels.

Where we are today

Before you start planning to cash in on these benefits, it helps to understand the three technological stages of Web-based management, keeping in mind that vendors are still churning out products that reflect each stage.

The first stage is Web-based access to managed devices such as hubs and routers. It was driven by a number of smaller network device vendors that couldn't afford to port their management tools to multiple flavors of Unix and integrate them with all leading platforms. In 1994, vendors such as Thomas-Conrad Corp. and Tribe Computer Networks began to deliver Web front ends on their hubs and routers, enabling users to manage these devices from any desktop.

The caveat is you can manage only one device at a time, but even that's better than swivel-chair management. The technique works well in small environments and for drilling down and troubleshooting a device you know is broken.

However, Web-based device management doesn't address enterprise management challenges, including continuous monitoring, fault isolation and long-term performance management. In short, it doesn't tackle the tougher, proactive management issues.

In the next stage, management vendors began providing Web access to their network management system databases via Web proxy agents. The agents plug into an existing net management system application, such as Hewlett-Packard Co.'s OpenView or BMC



Recipe for success

- ✓ Use the Internet as an integration and testing ground.
- ✓ Let customers test drive Web-based management tools posted on vendor Web sites.

Software, Inc.'s Patrol, and handle the translation required to pass management information to a browser. The agents make it easy for vendors to provide fully distributed, browser-based management consoles. This is an obvious step toward addressing users' cries for platform independence, scalability, mobility and distributed consoles.

The third technological stage, which is receiving the most attention from management vendors, is the implementation of Java-enabled management applets. Kaspia's Automated Network Monitoring System, for example, lets users dynamically create Web

Check out Network World Fusion to learn more about Web-based management standards, including:

- The DMTF's Common Information Model
- Web-Based Enterprise Management
- Java Management API

You can also learn more about Cable & Wireless Internet Exchange's CWINTRA from the horse's mouth, the CWINTRA site.

And check out Jeff Case's recent *Network World* story in which he explains the net management jobs for which Web technology is best suited.

www.nwffusion.com

pages fueled by management information the system collects in close to real time. Users can customize pages to report on their specific domains of responsibility.

Micromuse USA, Inc. is also delivering Java-enabled clients to improve the functionality of its Netcool/OMNibus management console. Micromuse's Java EventList handles the distribution of operator-specific views for mission-critical services and can aggregate management information from installed network management systems. This kind of functionality provides customized service-level views so target audiences see only the level of detail they need to monitor a particular service.

The recipe

Multiple standards efforts are under way to detail how products representing all three stages should work together. The efforts receiving the most attention from vendors and analysts are Sun Microsystems, Inc.'s Java Management API (JMAPI) and Web-based Enterprise Management (WBEM). The WBEM initiative was introduced last summer by a vendor consortium that included Intel Corp., Microsoft Corp., Compaq Computer Corp., BMC and Cisco. The specification work for WBEM has now officially been handed off to the Desktop Management Task Force and the Internet Engineering Task Force (see story, page 76).

Unfortunately, Sun and Microsoft seem at odds over how JMAPI and WBEM can be used together to improve the state of enterprise management. Watching from the sidelines are many management application vendors that are trying to deliver innovative solutions based on Java and existing standards rather than jumping into one camp or the other.

The solution seems simple. JMAPI is more advanced in work aimed at instrumenting devices to deliver management information, and in developing a common look and feel for browser-based consoles. WBEM is further along in developing a metamodel, which is a common repository for various types of management data.

Each camp should realize it brings something valuable to the table. Rather than each side re-creating work the other has done, they should work together to implement critical components that already exist, and put the mudslinging aside. Users are sick of being put in the middle of vendor and standards wars.

Similarly, vendors need to continue to use

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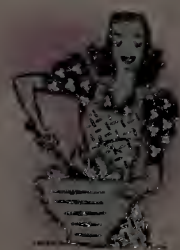
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well-established, legacy management protocols such as SNMP. SNMP-enabled devices are everywhere; customers have invested heavily in them. Vendors should continue to use SNMP for performance and fault monitoring. That will leave more resources to devote to areas that SNMP doesn't adequately address, such as configuration management, manager-to-manager communications and remote troubleshooting — areas that Web-based tools, based on standards such as WBEM, could effectively address. Jeffrey Case, one of



Recipe for success

Mix

- ✓ Parts of IMAPI - device instrumentation, common look and feel
- ✓ Parts of WBEM - meta-schema (the common repository for management data)

Form one coherent standard, obviating the need for each group to duplicate the other's work.

the authors of SNMP, made the case for this just two weeks ago (NW, April 21, page 41). Vendors should heed his advice.

In their rush to adopt new standards, vendors also need to be careful not to create additional complexity. For instance, some network device vendors have already implemented dual SNMP and HTTP protocol stacks for providing management information. This approach risks data integrity and increases complexity for users. Vendors should look to provide one set of management information through an integrated SNMP/HTTP stack.

In fact, vendors should look to reduce complexity by building more intelligent, localized, automated management directly into their offerings. Sophisticated switches and routers should be capable of dynamic problem isolation, localized event correlation and automatic corrective actions for common problems. Network device vendors should offer the ability to set enterprisewide policies that specify how to handle common errors. For example, you should be able to define a policy for suppressing a broadcast storm to control its impact on the network.

Some vendors are on the right track. Today, a UB Networks, Inc. switch can use its own Remote Monitoring (RMON) information to determine the source of a problem and disable a malfunctioning port without interacting with a management console. UB's NetDirector Web-based interface allows an operator to monitor and even manually intervene in the automated diagnoses and resolution of malfunctioning network devices.

Vendors also should use Web innovations from areas other than net management. Security standards developed for electronic commerce, for example, could ensure that Web-based management offers better security than SNMP over User Datagram Protocol (UDP). Web-based management solutions should look to incorporate the Secure Sockets Layer protocol pioneered by Netscape Communications Corp., which ensures a secure socket connection between a browser and host server. There's also Secure-HTTP, an extension of HTTP for authentication and data encryption between a Web server and Web browser. Even public- and private-key technologies can be leveraged to control

access to management systems or devices.

Another Web innovation that benefits management applications is the use of "push" technologies to deliver critical, real-time information to a browser. Today, the bulk of Web-based management relies on SNMP's polling-based "pull" model. For example, when a browser is pointed at 3Com Corp.'s Transcend dRMON Edge Monitor System, a Java applet queries for new RMON values, thus pulling the updated RMON network status information to the browser display.

But the idea of having to point a browser at every device you want to manage won't cut it in a large enterprise net. So 3Com is prototyping the use of various push models to provide real-time changes. One model is a server-based Java application that listens to device-generated SNMP change traps and, in turn, reports (pushes) any changes to the active management browser. By using Web push technology, vendors can start to deliver dynamic device and enterprise management information in real time to network operators and IT business users via a browser interface.

Companies such as FTP Software, Inc. combine push and agent technologies in automated Web-based management tools. FTP's idea is to have an agent manager push an intelligent agent to a network client to perform designated tasks, without user interaction. As the agent application carries out its mission, it reports status to the agent manager. This could be used for common operations such as data collection or even firmware updates.

In their efforts to integrate Java, agent tech-



Recipe for success

- ✓ Use established management protocols - notably SNMP - for performance and fault monitoring.
- ✓ Use Web technology for areas that haven't been adequately

addressed: configuration management, manager-to-manager communications and remote troubleshooting.

nology and many emerging Web standards, vendors should also leverage the 'Net as an integration and testing ground. By hosting versions of their Web-based management tools on their Web sites, vendors can test and simplify integration among their applications. Additionally, users can evaluate products online without having to download megabytes of application code.

Perhaps most important, vendors need to spend more time talking to their customers to understand their needs, so the vendors can focus on simplifying and automating the right management tasks.

A positive industry trend is that a number of vendors are helping IT form a link with their business stakeholders to meet corporate objectives. The ability to provide customized line-of-business views and service-level monitoring for the enterprise will be critical in helping IT shops meet the needs of their business users. Products such as INS' Enterprise-PRO service and Kaspia's Automated Network Monitoring System are beginning to address these requirements.

Finally, management vendors have traditionally been able to agree on only one thing when it comes to significant management

Why wait? Build your own Web-based management framework

Browsers are eating into Web-based management standards that won't likely be decided anytime soon. But at least one company has fashioned its own Web-based management framework from existing standards and products.

Cable and Wireless Internet Exchange (CWIX), in Vienna, Va., provides global Internet backbone services to Internet service providers and large multinational corporations. In April, CWIX rolled out an internal/external business platform, called CWIXTRA, that gives customers a secure view of the entire network service, as well as status and account information. CWIX uses to run and manage its own network worldwide.

Through any Web browser, CWIX customers can access CWIXTRA to view real-time information on their network operations, receive automatic alarm notices,

RECIPE FOR SUCCESS:

Carefully mix:

- ▶ Off-the-shelf products - Lotus Notes and Domino
- ▶ Defacto standards - Java, CORBA, JQP, VRML

Form into flexible architecture to support both internal and external management and business applications.

monitor and manage mobile devices and the network performance. Additional features to be rolled out this summer will let customers change or upgrade their service, order new service and access their billing information online.

"What's unique is that it's an extension of the same tools we use to manage our own business. And there's no proprietary client interface — you use a Web browser," says Patrick Murray, CWIX's director of operations.

CWIX began work on CWIXTRA just last August, initially for its own customer support, accounting and related business functions. It used a mix of off-the-shelf products and de facto industry standards — Lotus Development Corp.'s Notes, Java and the Common Object Request Broker Architecture (CORBA).

"What we've done basically is stripped out back-end systems in object-oriented technology and then tied all of that to standards-based Web technology for universal access," Murray says.

"There's a lot of glue between our management systems and the Web browser," he says. "The challenge is to develop that glue by issuing standards because a lot of this technology is still being developed and formalized."

CWIX uses Corporation Systems, Inc.'s JQP as its network management platform. Other applications provide troubleshooting, account billing, order entry and related networking and customer service functions. CWIXTRA built all of these back-end systems using CORBA and provides Web access using the Internet Inter-ORB Protocol, a protocol for providing CORBA-compliant applications with HTTP-based transport.

Lotus Notes and Domino serve as the application platforms that support customers, business partners and CWIX internal users. The backbone to them however is facilitated by industry standards such as Java and Virtual Reality Modeling Language.

"Because the Internet is a high bandwidth environment, it makes sense to use the Internet as the transport core layer," Murray says. At this point, he says, these efforts are focused on using the technology to help meet new business opportunities. "It's a question now of what do we want to do now and what will the architecture let us do."

— Michael Kuepper

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Recipe for success

- ✓ Use push technology to deliver critical, real-time information to a browser
- ✓ Use agent technology to automate designated tasks

standards efforts: not to implement them. For the sake of their customers, vendors must embrace the Web and devote resources to tracking WBEM and JMAPI. These efforts can benefit both users and vendors, so it's in your interest to help ensure they don't deteriorate into grand ideas that create more confusion without solving any problems.

Parting thoughts

In all likelihood, the next generation of communications equipment, computer systems and other network-attached devices—including printers, scanners, fax servers and storage systems—will connect to your intranet via Web protocols. With its platform independence, ease of integration and anywhere/anytime accessibility, the Web is on its way to becoming the standard graphical user interface—not to mention the point of connectivity and integration for device administration and enterprise management.

Leading network and systems management tools will likely continue to provide many critical enterprise services such as discovery, real-time monitoring and event correlation. But the tools should become simple Web applica-

tion servers integrated through the browser.

To realize this vision, vendors should focus innovations around Web technology to shift resources away from the resource-consuming tasks of platform ports and testing. Users will benefit almost immediately from lower cost of ownership because they'll devote less time to training and integration, and be able to easily distribute the tools through the enterprise.

Web technology presents a real opportunity to take some long-awaited strides in network and systems management functionality. The low cost, ease of use and platform independence of Web technology solve a lot of problems. However, it will never realize its potential unless vendors learn from the past and work together to ensure the technology is used most effectively.

Forbath is a consultant at Northeast Consulting Resources, Inc. in Boston. He balances his consulting practice among global enterprise customers, leading industry vendors and IT service providers, helping them to bring distributed computing to production service levels. He can be reached at forbath@ncr.com.

Recipe for success

Use Web-related innovations developed in other areas, such as electronic commerce security tools:

- ✓ Secure Socket Layer (SSL) protocol
- ✓ Secure Hypertext Transfer Protocol (S-HTTP)
- ✓ Public/private key technologies to control access to management systems



Web helps payroll firm keep watch

Like renting a house, network outsourcing shields you from the plumbing. But add a dose of the World-Wide Web, and you can still keep a close eye on how the water's flowing.

ADP Corp. in Roseland, N.J., runs its own nationwide network to support the payroll management and other services it provides to corporate customers. But the company believes in outsourcing certain functions it doesn't want to develop or maintain on its own, including some aspects of network management and monitoring.

So ADP was open to the idea of using EnterprisePRO (EPro), a Web-based monitoring and capacity planning service provided by International Network Services, Inc. (INS) in Sunnyvale, Calif.

"We needed a way for our engineers to get a quick snapshot of the network while they're planning new links for service to our customers," says Michael Del Secolo, senior director of communications engineering at ADP. "They needed to be able to look at a wide-area link between two sites, for instance, and see if there's enough capacity left to handle the traffic that a new customer or a new application is going to generate."

Using Web browsers on their office, home or portable PC, ADP's network

engineers can access an EPro Web page that shows real-time link utilization and router CPU utilization anywhere on the ADP network. EPro provides long-term statistics, as well.

"We can run filters depending on what exactly we're looking for and then generate network reports based on those filters," Del Secolo says. "It does a lot of correlation and reporting that I don't have to script and maintain, which is nice."

ADP's in-house network administrators use NetView for AIX as their enterprise management platform, with various monitoring and troubleshooting applications running underneath it.

But these applications are difficult and expensive to run remotely, Del Secolo says. "The capacity planning tools that run under NetView are much more cumbersome and were never easy for our engineering staff to access," Del Secolo says. "EPro is a much simpler tool for what our engineers need to accomplish and actually provides us with more capacity planning capabilities than NetView does. It's made our learning curve much faster and made our network provisioning much more efficient."

—Michael Csenger

Recipe for success:

- Find out if EPro is for you. Take it for a test drive on the Web at www.ins.com/epro.

WBEM and JMAPI: The standards and their prospects

To understand the Java Management API (JMAPI) and Web-based Enterprise Management (WBEM), you first have to understand that WBEM actually has little to do with Web usage or browser management. It focuses on specifying a standard data model, referred to as a metadata schema, that will store management information collected by SNMP, Desktop Management Interface, Common Management Interface Protocol and other management protocols as be stored and accessed from a common repository.

The Desktop Management Task Force (DMTF) is finalizing the first major component of WBEM, a Common Information Model (CIM), which is intended to address the need for a common way to describe and share management information across the enterprise. BMC Software, Inc. and Hewlett-Packard Co. have already committed to supporting CIM as their management tools by the end of 1997. The other two components of WBEM include Hypertext Transfer Manager (HMTM), a translation mechanism for converting managed device instrumentation information to CIM formats, and Hypertext Transfer Management Protocol (HMTMP), a proposed transaction specification for Web-based management.

JMAPI is a critical component of SunSoft, Inc.'s Java-based Software Workshop initiative, a prototyping environment for building Web-based network and systems management tools. JMAPI is intended to be a standard set of class libraries, API classes and user interface specifications that will be used to promote with its partners' support.

JMAPI could offer vendors and users a standardized look and feel for Web-based management, as well as reduce the development effort vendors invest in the tasks of displaying information and building management tools.

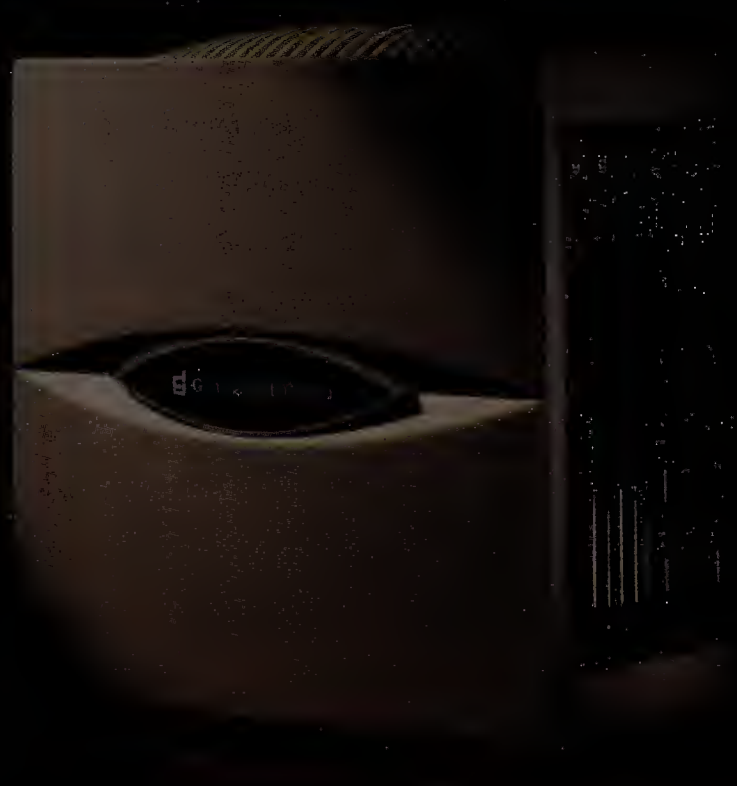
High-level portions of JMAPI, such as a schema definition, overlap with WBEM. But these portions have not yet materialized. Nevertheless, a number of network element providers, including Cisco Systems, Inc. and Bay Networks, Inc., have committed to JMAPI.

Unfortunately, the IT industry has found it easier to write specifications than to get them widely adopted. There's a good chance JMAPI and WBEM will never fully materialize. However, industry observers note that there have been some gradual shifts in the driving forces behind today's standards bodies.

Years ago, participation in standards bodies was left to academics and technologists. During the past five years, senior engineers from many of the leading vendors became actively involved. And more recently, they have been joined by their product marketing colleagues.

While critics view this with increasing skepticism, one must keep in mind that fairly does the best technology win in the market—the best marketing does. With seasoned marketing folks behind the standards efforts, perhaps we'll see stronger messages about the importance and value of implementing these new management standards across the independent software vendor management community.

—Theo Forbath



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Circle Reader Service #25

HP and LANart: PORT SWITCH HUB KINGPINS

By Jeff Bankston

If a salesman promised you he could deliver increased LAN performance for only a slight increase in cost, you'd probably dismiss him as a fast-talking huckster. Well, port switching hubs offer just such a promise — to dramatically ease network congestion in a manner similar to a high-end frame switch but without the complexity or cost.

Port switch hubs are a cross between common repeater hubs and full-blown switches. Instead of making each port a subnet, they maintain four or eight internal segments, each of which acts as a subnet for the ports connected to it (see story, page 80).

In our tests of five such devices, we found all performed well in multisegment testing, and each had its own benefits in specific situations. But our Blue Ribbon went to Hewlett-Packard Co.'s AdvanceStack 10BT Switching Hub-24R, which was the most fully featured and cost-effective unit for new or growing networks. Its score of 9.7 out of a possible 10 was impressive.

LANart Corp.'s SegWay ETP8020 came in a close second, thanks to its backbone connectivity features. In addition to its eight 10M bit/sec ports in the back for extending LAN segments to a campus backbone, SegWay may have taken top honors if not for its command-line management interface; the unit would benefit from the menu-driven management offered by HP

AdvanceStack and SegWay are tops in a field of five port switch hubs, but all deliver performance gain for short money.

AdvanceStack.

Both SegWay, which scored a 9.3, and the AdvanceStack earned our World Class Award, which goes to any product that scores 9 and above.

For an inexpensive yet amazingly easy upgrade from shared Ethernet, Compex, Inc.'s FreedomSwitch comes as close to a drop-in solution as you can get.

Transition Network, Inc.'s StackMaster Pro SPS2000 and 3Com Corp.'s SuperStack II PS Hub 40 exhibited fine performance. But both require external devices to communicate between segments, effectively pricing them out of reach if you're looking for a one-stop upgrade from shared

Ethernet. Even though the HP AdvanceStack required the addition of a switch module to accomplish this function, its total cost still was within reason.

Configuration and installation

All of these products offer 24 10Base-T Ethernet ports. The HP, 3Com and Compex units have four internal segments, while the LANart and Transition Networks switches have eight. As noted, LANart's SegWay also features eight 10Base-T ports in the rear of the unit for connections to the backbone of a larger network.

Similarly, Compex's FreedomSwitch includes an extra 10M/100M bit/sec uplink you can use to attach a server or provide a 100M bit/sec connection to a Fast Ethernet switch.

Using a stackable circuit card, you can connect seven Transition SPS2000 expansion units for a maximum port capacity of 190. The Compex is equally expandable to meet growth.

All the products have LEDs that show traffic flowing on ports. HP's AdvanceStack has a light for each device plugged in as well as an outstanding array of activity lights so you can tell what each segment is doing.

FreedomSwitch's LEDs indicate connections, collisions and faults. It also displays two digits indicating traffic volume. For example, a 26 means 2.6M bit/sec of switched traffic is being processed.

We had a bit of a problem with the StackMaster's traffic indicators, which for each user port show active, collision, partitioned or inactive status; they're hard to see at some angles.

Most of the units were easy to install. It involved connecting to the switch's terminal port using a null modem cable, setting the unit's IP address and SNMP community (which basically defines to which management station the device should send management data) and plugging in the 10Base-T cables.

After you have installed and configured via the null modem connection, you can telnet into any of the devices for other configuration and remote management tasks.

Two of the devices — LANart's SegWay and Transition's StackMaster — have a joystick and LED display that allow configuration and control of the device from the panel. SegWay's is a bit simpler to use, although configuration via software is easier for both.

SegWay's default configuration is one segment and one logical LAN. Automatic load balancing is disabled by default, so you need to turn it on for any segment that you need to load balance. This is done as a starting point for possible backbone traffic connections using the rear eight ports of the switch.

If you have multiple segments created either manually or by automatic switching, the switch balances the load within each segment but not across segments.



LANart's SegWay was a close second to HP on the strength of its backbone connectivity features.



HP's AdvanceStack takes the Blue Ribbon. Even a novice would be at home with this switch.

Additional load balancing between segments is accomplished via the rear port connections.

This is the complicated part of SegWay. While SegWay's eight segments make it a better overall performer, the HP and Compex devices handle load balancing completely automatically.

On the other hand, with the SegWay hub you can map any segment to a backbone connection and out to a frame switch or a router — an impressive capability.

Management software

After installation of the hub, you need software tools to make switch management easy. HP blows the competition away on this front with its menu-driven interface for



Transition's StackMaster was a good performer, but lacks intersegment connectivity.

managing the AdvanceStack. You connect to the unit via a null modem cable, hit the Return key twice, and HP's logon screen comes up. All the units are manageable via telnet with adequate remote security to guard against intrusions.

The menu-driven ASCII console is simplicity itself, but the HP Assistant software provided with the switch takes management to another plane. It comes in Windows 95 and Windows NT Workstation flavors, making it easy to install.

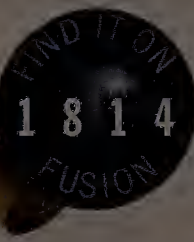
HP Assistant scanned all the connected networks and revealed where IPX and IP devices were, along with what was connected to what. Other frequently used menus included the Hub Status and Counters Menu. The Display Hub Ports counter was key to determining if a port was at fault or causing collisions on a segment.

Management of Compex's FreedomSwitch is also command-line only. Some of the commands are cryptic at first but easier to understand with experience.

One interesting feature of the Freedom-

LanOptics' switch port hub wasn't released in time for our testing, but you can find details about the product on Fusion.

We've also created links to vendor sites with info on the products we reviewed



www.nwfusion.com

Switch is its ability to watch traffic. Three commands — GET SEGMENT STATS, GET SEGMENT MATRIX and GET LBS STATS — told us all we needed to know about the switched traffic flow. And while a host of commands can tune the switch, we found that nearly every setting worked fine in its default state.

3Com provides the simple and effective Windows-based Transcend Quick Manager software. With in-band management, the software is easy to use and allows you to see what the switch is doing.

This version of Transcend is the little brother to the enterprise edition used to manage 3Com's other networking equipment. We had the switch operational in just a few minutes and spent less than 15 minutes configuring the unit for the SNMP community, traps and other features.

Performance

All the management features in the world won't help you without good performance to back them up. About three minutes after we turned it on, HP's AdvanceStack began



Compex's FreedomSwitch is simple to use and has automatic load balancing.

segmenting and balancing traffic load. Ethernet begins to experience collisions and dropped packets at 45%, but collisions went away when automatic load balancing kicked in. We used the management tools to verify what the unit's LEDs were showing, watching the segment traffic by packet, collisions and fragments.

The FreedomSwitch performed automatic load balancing almost as easily as the HP product. Once the FreedomSwitch was working for about 30 minutes, the Segment Counters

A new kind of hub

What exactly is port switching, and how does it differ from the frame switching large network systems use?

Networks are made up of segments on which devices transmit data. Think of each segment as a two-lane highway that comprises an Ethernet collision domain. If too many devices use a segment, packet collisions can cause a massive traffic slowdown.

Switching devices get around that problem by creating separate segments for each device or group of devices. Port switches decide which physical "lane" traffic needs to go to and direct traffic from the physical port to that lane. Each lane is actually a backplane segment on the switch.

Because the switching is performed locally in logic circuits and at wire speed, port switches are easier and cheaper to implement than frame switches but provide many of the same benefits.

Frame switches look at each Ethernet packet, determine which segment it is on and to which segment it is going, and send it on its way. The intelligence required for reading packet frames adds considerable cost, but frame switches are significantly better performers than port switches.

Either way, the result is significantly reduced congestion because more traffic lanes are available. In general, the more segments you have available, the better the network will perform.

revealed the true worth of the four segments, and we saw response time drop dramatically.

However, we had no firm idea of the percentage of bandwidth each segment used. A graphical representation of the segment utilization, which other switches offer, would be nice, although you can use menu options or the software Compex provides to watch performance.

With LANart's SegWay, we significantly improved network performance by using five of the unit's segments. Testing with clients on all eight segments overloaded our servers before maxing out the network. After 10 minutes of heavy traffic load, the SegWay dropped back to using only four

segments, demonstrating that an average small network will not benefit significantly from more than four segments.

The Compex and HP products performed equally well; having only four segments was not a problem, and load balancing worked as advertised. We saw rates of 2.9M bit/sec across all segments, and the options and settings were easier to configure than on SegWay.

3Com's SuperStack II was another story. Our first bandwidth tests showed collisions starting at 45% network utilization and steadily mounting into the 65% range. We then tried to segment the networks. This is where the unit fell flat on its face. While we didn't have a problem configuring the unit and putting users on a segment, we needed a router or a higher end frame switch to

ScoreCard

	HP AdvanceStack 10BT Switching Hub-24R	LANart SegWay ETP8020	Compex FreedomSwitch	Transition StackMaster Pro SP52000	3Com SuperStack II PS Hub 40
Overall score	9.7	9.3	8.7	7.8	7.5
Performance (30%)	9	10	9	8	8
Flexibility and ease of use (30%)	10	9	10	7	7
Management/administration (20%)	10	8	7	8	7
Enterprise scalability (10%)	10	10	9	8	9
Installation (5%)	10	10	10	9	10
Documentation (5%)	9	9	3	9	8



NetResults

Product	AdvanceStack 10BT Switching Hub-24R	SegWay ETP8020	FreedomSwitch	StackMaster Pro SP52000	SuperStack II PS Hub 40
Vendor	Hewlett-Packard Co. (800) 752-0900 www.hp.com:80/rnd/products/10thubs/hub1224/hub1224.htm	LANart Corp. (800) 292-1994 www.lanart.com/products/data/segwayps.html	Compex, Inc. (800) 279-8891 www.cpx.com/is1.htm	Transition Networks, Inc. (800) 526-9267 www.transition.com/products/stackpro/2000_hub_desc.html	3Com Corp. (800) 633-3366 www.3com.com/files/products/dsheets/400234.html
Price	\$1,695	\$1,695	\$1,995	\$999	\$1,395
Pros	<ul style="list-style-type: none"> ▲ Superior automatic load balancing ▲ Excellent management software and activity LEDs ▲ Easy to configure ▲ Most cost-effective 	<ul style="list-style-type: none"> ▲ Strong backbone connectivity ▲ Load balancing across eight LAN segments ▲ Highly expandable 	<ul style="list-style-type: none"> ▲ Automatic load balancing ▲ Simple to install and manage ▲ Includes extra 10M/100M bit/sec uplink ▲ Highly expandable 	<ul style="list-style-type: none"> ▲ Very fast ▲ Highly expandable 	<ul style="list-style-type: none"> ▲ Easy to install and configure ▲ Management software is easy to use and effective
Cons	<ul style="list-style-type: none"> ▼ None are significant 	<ul style="list-style-type: none"> ▼ Lacks menu-driven management interface ▼ Load balancing is a bit difficult to configure 	<ul style="list-style-type: none"> ▼ Documentation is substandard ▼ No graphical depiction of segment utilization 	<ul style="list-style-type: none"> ▼ No load balancing ▼ Requires external router or switch to connect segments ▼ LEDs can be hard to see 	<ul style="list-style-type: none"> ▼ No load balancing ▼ Requires external switch or router to connect segments

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move data between segments. This entirely defeats the purpose of the port switch.

If you never intend to allow traffic to cross between segments, or if you already own a frame switch or a router, this may not be a problem. But it seems an odd design choice for a product targeted at small workgroups and businesses that can't afford routers or high-end switches.



It took less than 15 minutes to configure 3Com's SuperStack II, but lack of intersegment switching is a drawback.

We also tried the SuperStack with only IPX/SPX traffic on one segment and IP and NETBIOS on the other segment. This worked well, significantly improved the performance of the networks and is an inexpensive way to segregate traffic of varying types. In fact, in this configuration, the SuperStack was the least costly product we evaluated.

Transition's StackMaster was a solid performer on flat Ethernet, using one segment across the chassis with utilization similar to the other switches. The switch does not provide automatic load balancing, however, and requires you to use a router or frame switch for intersegment traffic.

While load balancing is an important feature, it is useless if intersegment communications is not possible. For a business looking to grow beyond shared Ethernet, this is a significant drawback.

And the winner is...

In the end, we gave the top mark to HP's AdvanceStack. Even a novice would be right at home with this switch. Only Compex's FreedomSwitch rivals the HP offering in terms of setup ease.

Overall, LANart's SegWay is a fine performer with excellent expandability. Its performance, however, is partially offset by the complexity of its configuration and management tools.

For workgroups of 50 users or fewer, Compex's FreedomSwitch is a bargain; it's a good choice for businesses looking to create their first network or to expand an existing one.

In the SuperStack II PS Hub 40, 3Com has a product that is cost-effective and accessible to the masses. But the company needs to offer local switching between segments. Such a move could position the SuperStack as the port switch of choice.

While Transition's SPS2000 showed fine performance across multiple segments, it requires a router or switch for the intersegment traffic—a big negative for many networks in which only occasional intersegment communication is required.

However, if you want a device that lets you isolate NetWare on one segment, NETBIOS on a second and TCP/IP on a third, the SPS2000 handles these with ease.

Bankston is a network design and integration specialist and vice president of operations at BCI Associates, Inc., a systems integration firm in Panama City, Fla. He designs network systems for 89 customer sites with more than 27,000 users. He can be reached via E-mail at bciasoc@nwave.beaches.net.

NetworkWorld TECHNICAL SEMINARS

IP_{v6} THE NEXT GENERATION FOR TCP/IP NETWORKS

The next generation of Internet Protocol — IPv6 — will significantly impact your TCP/IP network. The Internet explosion now requires new functions that go beyond the capabilities of the current Internet Protocol, or IP. These include enhanced security, support for real time traffic flows and expanded addressing capabilities. The addressing issue has been one of the most significant concerns as it was predicted that the Internet community would run out of available addresses, thus limiting the growth of this critical communication resource.

In late 1990, the Internet Engineering Task Force (IETF) initiated efforts to select a successor to the IP. In late 1993, the IETF formed the Internet Protocol — Next Generation (IPng) working group, which was chartered with investigating the various proposals, and recommending a course of action. The outcome of those efforts produced what is now known as IP version 6 (IPv6), which is currently being implemented by many vendors.

Perhaps more importantly, IP is the foundation of the TCP/IP protocol suite. Therefore if IP is revised, other protocols must be changed as well. The significance of this protocol revision extends to LANs, MAN and WAN transmission systems, as well as the upper layer protocols and application programming interfaces.

Whether you are a network manager, designer or software developer, this seminar, taught by internetworking expert Mark Miller, will provide you with information on the widespread ramifications of this new protocol. You will learn how to effectively plan and implement a successful, orderly transition.

Enterprise Network Management Understanding SNMP, SNMPv2 and RMON

With the explosive growth of enterprise internetworks, the need for integrated network management systems to help simplify management operations has never been greater. Today's enterprise network management systems need to manage thousands of elements — from the hardware devices all the way to the applications and processes running on these networks.

SNMP (Simple Network Management Protocol) has become the de facto standard for end-to-end enterprise network management. Recent enhancements to the SNMP-based technology, including SNMPv2, RMON2 and Web-based management tools, improve this popular system. With these enhancements, however, come additional challenges for the network manager.

This one-day, information-packed seminar, taught by internetworking expert Mark Miller, will help you understand the elements of an SNMP-based network management system, how to implement SNMP with your internetwork, plus the various enhancements such as the new message formats and improved error codes provided with SNMP version 2. You will learn about recent enhancements to the Remote Monitoring (RMON) network management architecture, known as RMON2, and the advantages of implementing RMON throughout your internetwork. In addition, you will see how SNMP is being used to manage broadband networks, including frame relay, SMDS and ATM.

You will also be introduced to the next generation of network management: Web-based tools that integrate SNMP and browser technology. This new technology consists of three components: network management software which runs on a Web server, proxy agents which operate on the managed devices, providing updates to the Web server, and a browser-equipped workstation that can access those management details from any location within the enterprise.

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5. Learn details of the proposed IPng solutions: CATNIP, TUBA and SIPP
6. Understand the key functional and protocol enhancements incorporated into IPv6
7. Analyze the format of the IPv6 packet header, Extension headers, ICMPv6 messages and Neighbor Discover messages, and others.
8. Gain detailed insights into how the IPv6 transition will affect other protocols, such as Ethernet, token ring, RIP and OSPF
9. Learn how to strategically plan your transition from IPv4 to IPv6
10. Learn how leading vendors such as Bay Networks, Cisco Systems, Digital, FTP Software, Sun and others are implementing IPv6
11. Learn about the future — a worldwide IPv6 network
12. Discover how to obtain public domain sources of further information on IPv6

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4. Understand the key components of the Web-based Enterprise Management: the HyperMedia Management Schema (HIMS), the HyperMedia Object Manager (HOM) and the HyperMedia Management Protocol (HIMP)
5. Learn the details of the key elements of the Internet Network Management framework: the SMI, the MIB and the SNMP
6. Discover how existing Web-based enterprise managers and existing SNMP-based devices can be integrated into a cohesive system
7. Understand the enhancements found in SNMPv2, plus the proposed security enhancements, SNMPv2a and SNMPv2b
8. Survey the key elements of Abstract Syntax Notation One (ASN.1), the language used to define SNMP message formats
9. Understand the key differences between the RMON and RMON2 standards for remote management of the enterprise
10. Consider strategies for the coexistence of SNMP version 2 with existing SNMP version 1 systems

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3/11/97	Dallas, TX	3/12/97
4/3/97	Washington, DC	4/4/97
4/8/97	New York, NY	4/9/97
4/23/97	Boston, MA	4/24/97
5/13/97	Atlanta, GA	5/14/97
5/28/97	Chicago, IL	5/29/97
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HOW WE DID IT

We tested the products on two networks using four servers: one running NetWare 3.12, another NetWare 4.11 and a pair running Windows NT Server 3.51. The servers ran Web software and back-end SQL Server transactional databases.

Because key data was residing on all four servers, the 10 clients in this small business setting had access to any server at any time. In this way, we could test the switches' ability to handle dynamic reconfiguring across the network to any of the servers as well as to the Internet access servers.

To stress the switches, we ran additional daily tasks such as data backups across the network.

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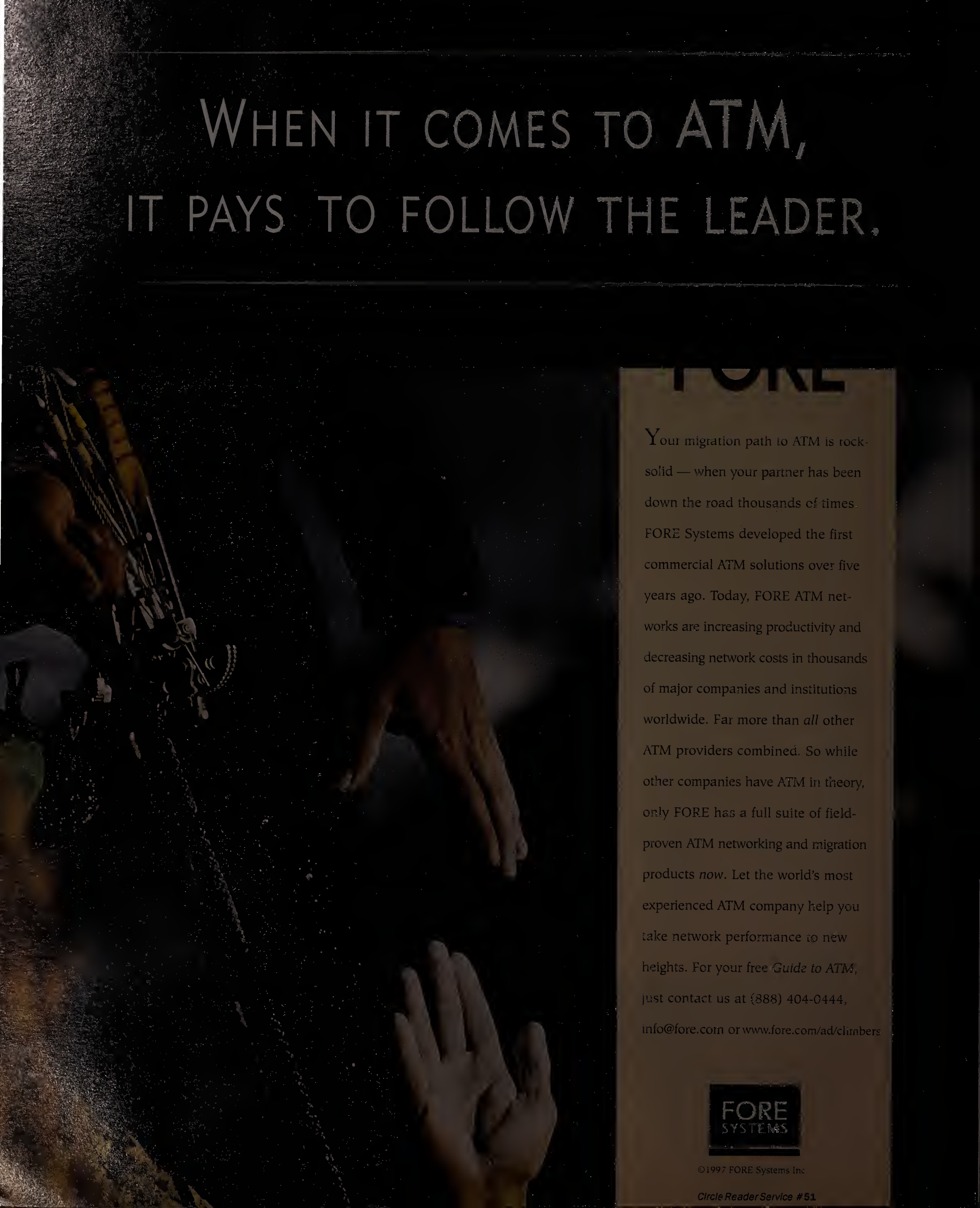
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Circle Reader Service #51

Crafting an AUP

... Chinese menu style

By John Dix

Are you dragging your feet on that intranet Acceptable Use Policy (AUP)? You could be leaving yourself open for abuse.

Consider this hypothetical scenario: A researcher at a respected medical institution uses the intranet to partake in a whimsical discussion about Coke vs. Pepsi. With a few keystrokes, a colleague posts the discussion on the Internet as a joke. Five hours later, some tabloid is pasting down this headline: "Harvard Medical Researcher Favors Pepsi."

To help speed the AUP development process, we gathered policies from five organizations and codified the contents into four main areas: information protection, posting rules/netiquette, technical guidelines, design guidelines, and guidelines concerning inappropriate use (all company references have been removed and "BigNet" has been substituted for the names of actual intranets).

You can get a running start on the development of your AUP by simply picking the bulleted items that seem appropriate for your situation. The information protection policy, however, is presented in one large chunk because it seems like a good foundation on which to build.

Information protection policy

This policy ensures the company's proprietary information is safeguarded commensurate with its sensitivity and value.

Company managers: Shall be responsible for implementing the policy within their group and applying guidelines as appropriate to their business function.

Employees: Are responsible for the protection of the company's proprietary information to which they have access. Protection includes following procedures outlined by the protection policy with regard to identifying, classifying, labeling and handling proprietary information.

Definition of proprietary information: Information that when improperly disclosed to unauthorized parties could affect the company's competitive advantage or could damage the company in other ways.

Labeling proprietary information: The originator or manager responsible for the information is responsible for classifying and labeling it at the time it is created. There are one nonproprietary and three proprietary information classifications:

- **Public (no label required):** This classification is intended for information that is nonproprietary in nature. No label or special protection is required. This type of information may be shared with anyone inside or outside the company.

- **Company Proprietary/Confidential: Internal use only (label required):** This classification is intended for information that is proprietary to the company. But due to a low level of sensitivity, it may be distributed to employees and nonemployees, such as vendors or contractors, who have signed a nondisclosure agreement.

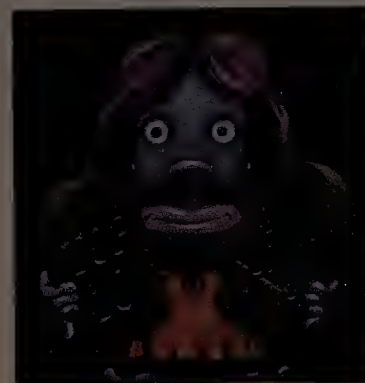
- **Company Proprietary/Confidential: Need to**

know (label required): This classification is intended for information that is proprietary and has a higher degree of sensitivity. Distribution is limited to employees who have a need to know and nonemployees who have signed nondisclosure agreements and need this information to perform their jobs.

- **Company Proprietary/Confidential: Registered (label required):** This classification is intended for information that is proprietary and has a high degree of sensitivity. If the information is improperly released, the company could be significantly harmed. Registered information must be numbered and tracked. Each copy is to be assigned to a specific person. Copies may be made only by the originator or manager of the information. This information is to be shared only with employees listed on the originator/manager's registered log and nonemployees listed on the registered log who have signed nondisclosure agreements.

Posting rules/netiquette

Basic security and netiquette for the intranet: Failure to follow these procedures may cause you to lose your posting privileges.



- **Content that is posted to BigNet must conform to the company's established procedures and protocols relating to the creation and sharing of information. Check with your manager if you are not sure of these procedures.**

- **Always use good taste, and keep away from posting pages that inflame and insult. Such pages will be removed from BigNet.**

- **Obtain written permission from the author or artist before including copyrighted material in Web pages. Even if there is no explicit statement of copyright, copyright law states that original works may not be reproduced, distributed or displayed without permission of the creator or copyright holder.**

- **Be sensitive to international issues. Be aware of cultural differences in meanings of colors, icons and social propriety. Avoid idiomatic language that might not be understood in other cultures.**

- **Prior to displaying or otherwise using a company database on BigNet, written permission (E-mail**

is okay) must be obtained from the department that is responsible for the data. Most company databases are proprietary, so permission prior to use is required to assure the information is correctly handled.

● If your page contains information that is Company Proprietary/Confidential: Need to Know, you must arrange for the system administrator to enable a user

name/password to protect the page.

● For pages that are intended to be private, but not at the level of Company Proprietary/Confidential: Need to Know, you may mount a page that is not linked to any other page, and share the URL with only those people who need to see it. Remember, however, that this private URL can still be found by robots and people sim-

ply guessing URLs.

● Any content that requires a lot of bandwidth must be approved prior to posting. Content that is bandwidth hungry includes but is not limited to multimedia, video and audio files. If you do not know if your content will have an affect on the network, contact your network IS representative prior to posting.

Technical guidelines

● Never open executable files unless the file was sent to you internally (not via the Internet) and you know for sure the person

sending the information is trustworthy.

● Minimize the use of multimedia—use it only when it adds value.

● Warn users about file sizes

and describe resources as part of a link. Provide brief annotations of links describing file type, size and content (for example, 40K PowerPoint presentation). This is especially important when a file may launch a helper application or a large graphic will be downloaded. For performance reasons, images on a page should amount to no more than 150K bytes. If it is necessary to include graphics over this limit, warn users about the file size as part of the link.

● When developing your Web pages, you may want to make an image into a location-sensitive hyperlink. That is, if the user clicks on one part of the image, it links to one page; if they click elsewhere on the image, it goes to a different page. This is done using an image map.

Image maps may be implemented by storing the map on the server or, alternatively, by pushing it down to the client as part of your HTML.

Not all Web browsers support client-side image maps, but they have some advantages. Most notably they are the ability to work stand-alone—without a back-end Web server and better feedback indicating to the user where the hyperlink will go. For these reasons, we recommend implementing both formats.

● Use a descriptive title on all your pages to aid automated agents, such as search engines. Search engines list only the page title as a link.

● Avoid use of counter programs, because they provide little meaningful information and consume processing resources on BigNet servers. For detailed access statistics, talk to a member of the network staff about log files. Counters may be used on the top-most departmental or project home page, but never on every page. Use of counters on personal home pages is strongly discouraged.

● Save disk space. Recycle images by linking regularly used images from the images directory on the server. Don't save duplicate copies of images in your working directory.

● Be aware of platform differences and their effect on pages. Test pages on other machines, as colors and screen sizes differ. Design your pages to fit the standard 640-by-480 pixel screen size.

● Personal home pages should be kept separate from department pages. All personal pages should be created using the company's personal page wizard.

● These guidelines are subject to change, pending approval of the appropriate review processes.



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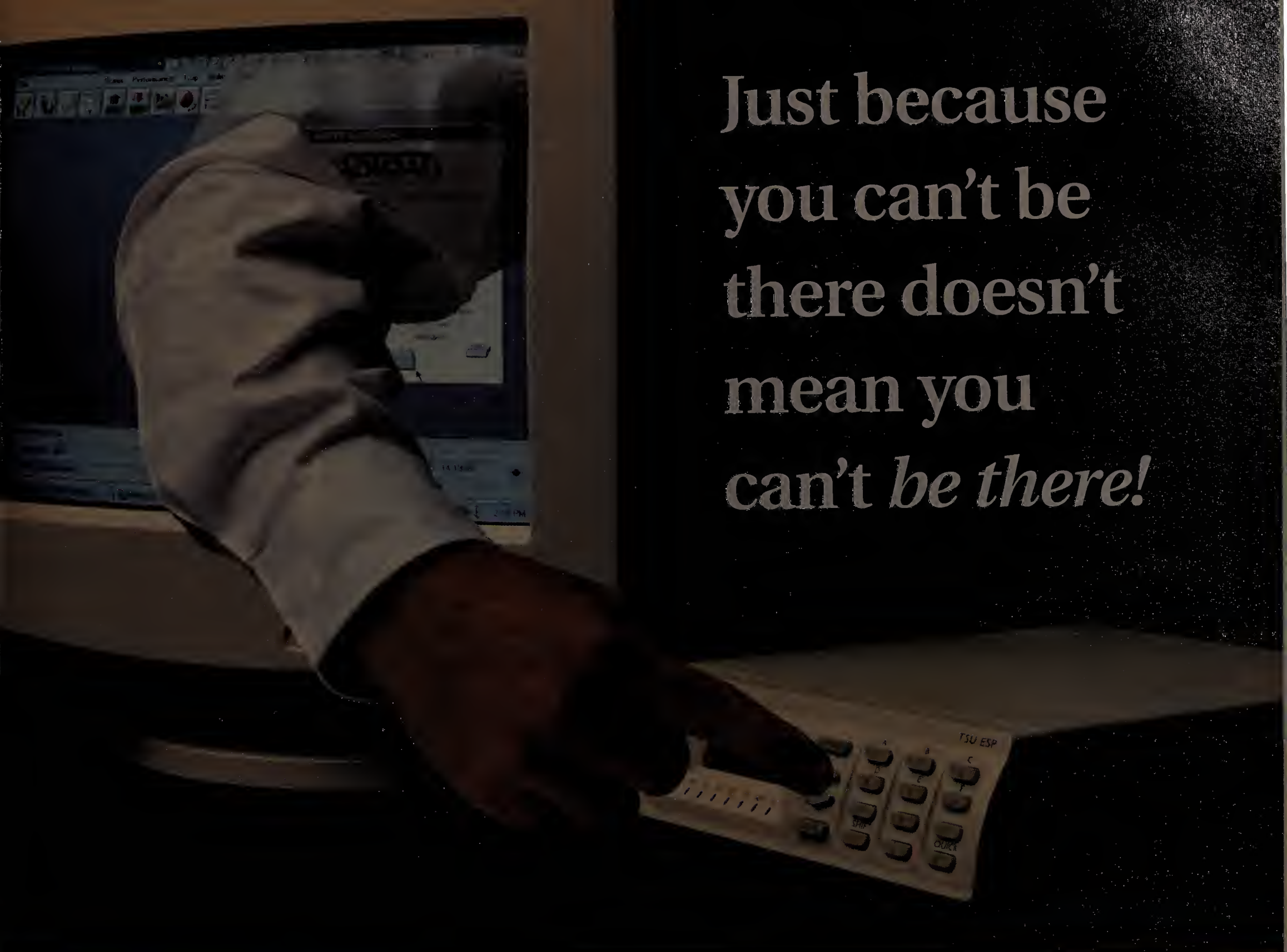


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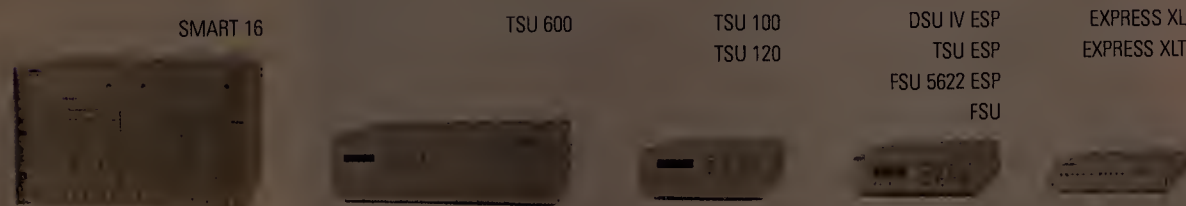
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Design guidelines

The design of a Web page relates to how easily users can access and interact with information. Web sites that are well designed are more frequently accessed and more effective in disseminating information than those laid out in a haphazard manner.

A well-designed Web site offers consis-

tency, resulting in a common look and feel across all pages. A consistent layout is also easier to maintain. The following are important design guidelines:

- Use of the BigNet navigation bar and other BigNet graphics is encouraged. However, the graphics may only be used if the original hyperlinks are retained. More specifically, the BigNet logo must always link

back to the BigNet home page; the search icon must always link to the BigNet search page; the feedback icon must always link to BigNet's feedback form; and the help icon must always link to the BigNet help page. This applies to all BigNet graphics. Also, the captions on the graphics may not be changed.

The intranet group developed a template

for a starting point. Visit the BigNet graphics library for official BigNet graphics and their appropriate links.

- Provide a title or signature graphic on every page. Offer consistent icons, images, colors and backgrounds.

- Provide consistently positioned navigational aids. Icons as navigational aids add visual interest to the page and help establish a unique identity throughout the site. Offer navigational links in every section. These should include links back to the BigNet home page and to your department or project home page.

- Provide identification information on each page including page title, group or department name, update date and contact information. The Inter-



net Services Group can set up an alias for your group to receive E-mail from your pages. Feedback forms are also an effective means of interacting with your users.

- Clarify the logical structure of your information, keeping the objective of the site in mind. Determine major divisions of information and relationships among the divisions.

- Modularize your pages into sections to facilitate readability. Pages should not exceed two or three screens. If a page is long, separate and organize it using section dividers or provide internal document links.

- Label links meaningfully, avoiding use of "Click here" or the actual URL as the link. For example, rather than "Click here for meeting minutes," use "View the meeting minutes."

- Adhere to browser conventions to avoid confusing your users. Indicate potential links with blue and visited links with purple. In situations where it is more effective or visually pleasing, alternate colors for links may be used. For example, on a blue background, a color offering contrast would be more effective than a blue link. However, it is critical that links change when they have been visited.

- Maintain and update links. Users get easily frustrated when they hit dead links.

- Use colors, images and backgrounds effectively. Text is more legible against a light background; there should be at least a 3 to 1 contrast. However, a white background may be harsh for reading text. Rather, use a light gray, light pastel or subtle texture for pages with extended passages of text.

- Most images are enhanced against a dark background.

- Avoid busy textures and bright backgrounds.

- Don't overcrowd your pages. Use blank space to create a balance.

- Images with embossed edges are effective as buttons.

- Always include the option of text links—a URL that includes only an image map and no text might not be accessible to users that do not have access to a graphical Web

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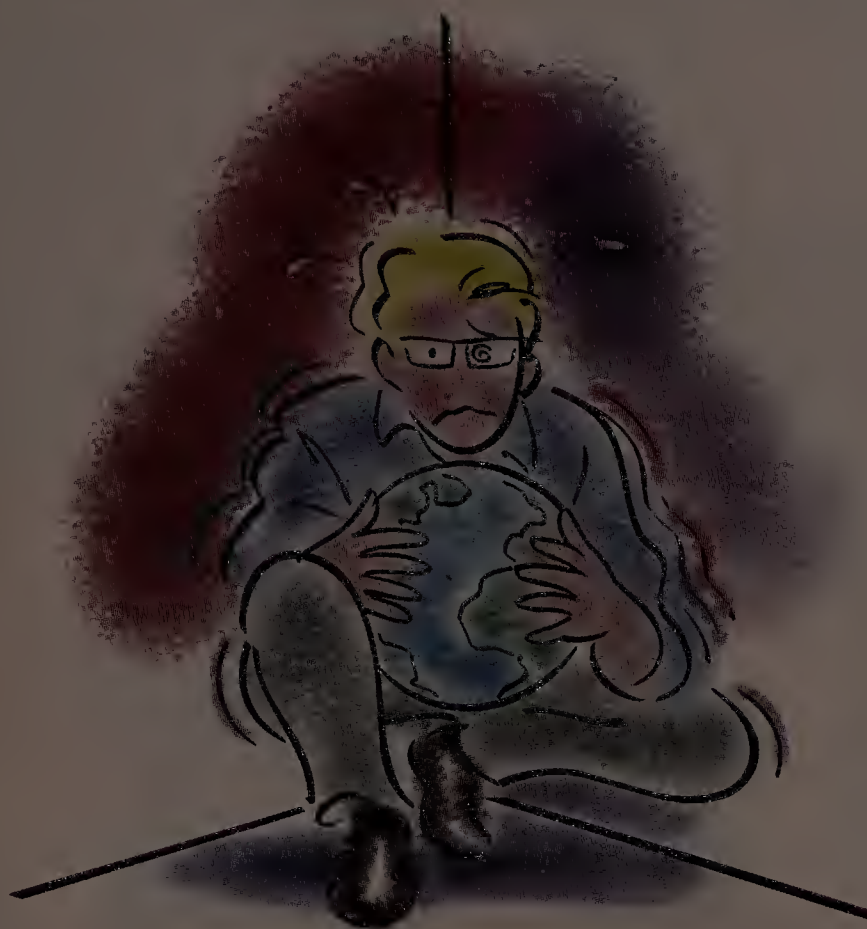
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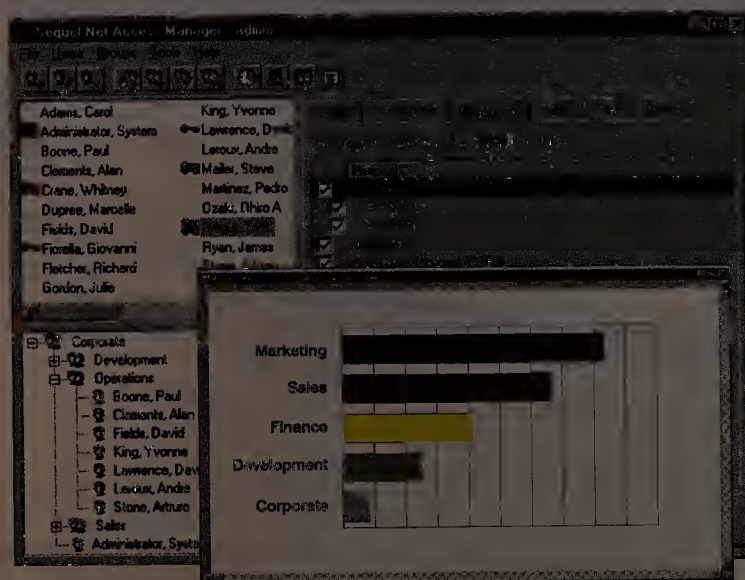
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Windows Sources, November 1996

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browser. Use the ALT option whenever you use the IMG tag. For example, `IMG SRC="sm_search.jpg" ALT="[Search]"`

Inappropriate uses

Intranet resources may be used only for purposes that effectively support company business goals and objectives or for non-

business purposes that are approved by management.

Uses of intranet resources that are always inappropriate:

- Disclosure of confidential or sensitive data owned by or entrusted to the company to any unauthorized individuals.
- Misuse of trademarks or servicemarks.
- Misuse of copyrighted material or

other copyright violations.

- Communicating in ways that disparage the products or services of other companies (excluding objective reports of substantiated fact with limited internal distribution).
- Communicating information that could be perceived as an official company position or endorsement without proper

management approval.

- Using confrontational or improper language or making statements that are defamatory.
- Creating, storing, viewing or transmitting pornographic, illegal or otherwise offensive material.
- Participating in any activity that could be interpreted as harassment.
- Misrepresenting an individual's identity or the source of communications or data.
- Attempting to break in to any intranet server without proper authorization.
- Accessing confidential information on computer resources without authorization.
- Promoting political or religious positions.
- Participating or engaging in activities that violate the law, the code of conduct, or any company policies or standards, including those of human resources, finance and security.
- Operating a personal business or using the intranet for personal gain.
- Soliciting, except as provided for in the human resources policies.
- Export or import of any governmentally controlled technical data or software (such as software encryption) to or from unauthorized locations or persons, without appropriate licenses or permits. ■

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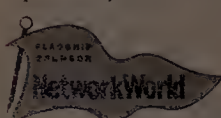
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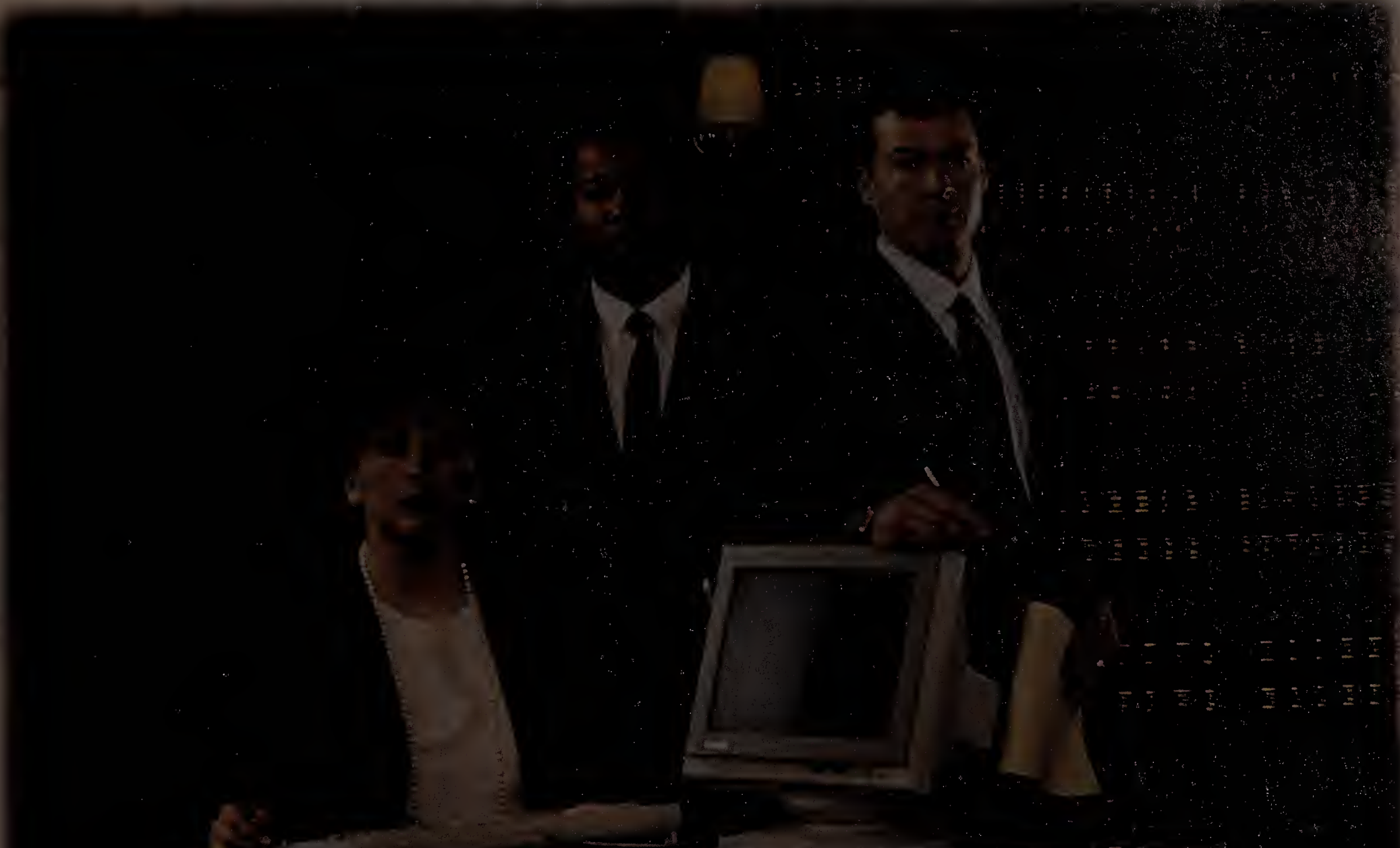
If your intranet ends up supporting corporate mail, your AUP should incorporate mail-specific language. That can be tricky given the pervasiveness and importance of the mail medium. To help, the Electronic Messaging Association offers "Privacy tool kit: A guide to formulating your company's policy for access, use and disclosure of electronic mail on company computer systems."

Here's how it is described at www.ema.org/html/pubs/pubnew.htm:

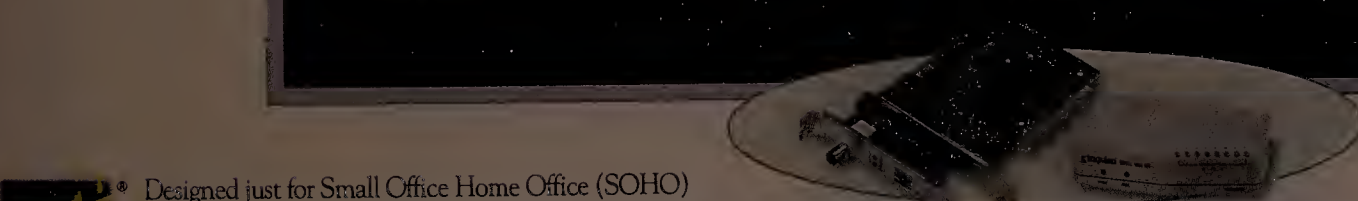
"Just updated, this comprehensive guide will assist human resources professionals and upper-level managers in formulating a corporate E-mail and Internet policy. The newly revised Privacy Tool Kit poses key questions in formulating policy, including all new considerations for Internet and Web use.


Offers a series of alternative policy formulations, enabling you to tailor policy to your corporate environment. 42 pages; 1997."

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■ **Novell, Inc.** is making it easier and cheaper for Certified Novell Engineers and Master CNEs to get Internet/intranet certification until July 31 in a promotion called **Increase your Net Worth**. CNEs who complete the \$595 Building Intranets with IntranetWare course at a Novell Authorized Education Center (NAEC) will receive a 25% discount off the \$85 fee for the IntranetWare CNE exam. In addition, they will receive a five-user version of IntranetWare.

Master CNEs can earn the Internet/intranet Solutions specialization and the IntranetWare CNE by passing exams for the Web Server Management course and the Domain Naming System and File Transfer Protocol Server Installation and Configuration course. The courses are offered at NAECs for a cost of \$795 and \$395, respectively.

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■ **Lotus Development Corp.** will offer technical training in a **TeleCafe Seminar Series**. You can access this series via a toll-free telephone call beginning this Wednesday and continuing on each consecutive Wednesday through July 9. The topics are Introduction to Lotus Domino, May 7; Lotus Domino Applications, May 14; Lotus Messaging Client Offerings, May 21; Calendaring and Scheduling, May 28; Lotus Components, June 4; Companion Products, June 11; The Admin Client, June 18; New Products from cc:Mail, June 25; Domino for the AS/400, July 2; and SmartSuite '97/'98, July 9. Each call begins at 9:30 a.m. and runs for one to two hours. You can sign up for any or all seminars.

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■ **Global Knowledge Network, Inc.**, an IT education company, announced it will train **Oracle Corp.'s** technical support employees on Windows NT 4.0 at Global's Innoversity education centers worldwide.

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Follow the Golden Rule before handing out pink slips

It takes consistency in management and proper documentation to fire someone.

By Loretta Prencipe

You catch an employee literally sleeping on the job, so you fire the person — and rightfully so, you think.

Not so, according to the court that heard the wrongful termination suit filed against Westinghouse Electric Corp. in 1987.

The dozing employee claimed "disparate treatment" and racial discrimination because he was fired without being given a chance to explain his on-the-job snooze. He won the lawsuit because his manager did not fire another employee — of a different race — who was previously

wrongful discharge cases because of statements made in employee handbooks or by managers. Saying, "Don't worry, you won't be laid off" can negate at-will status and be interpreted as an implied promise for long-term employment.

That's not to say it's impossible to fire someone, according to Rita Risser, attorney and founder of Fair Measures Management Law Consulting Group, a human resources consulting firm in Santa Cruz, Calif., that works primarily with high-tech companies. You can still issue walking papers to unsatisfactory employees as long as you lay the proper foundation and follow the Golden Rule, she says.

What's the Golden Rule got to do with firing someone? Simply put, you should treat employees fairly and equally, just as you'd want to be treated. That means documenting an employee's poor performance and communicating displeasure when it is not up to par.

You should also give the employee a chance to improve. After the initial

embarrassment or anger following a reprimand, an employee usually appreciates being offered the chance to improve.

Employees shouldn't be surprised if they are fired for poor performance, Risser says. After all, termination is the culmination of a process, not the result of a single event — and it all starts with good documentation (see story, this page).

However, not all employees can be saved; with some, you're better off letting the termination process run its course. Before taking any action, ensure that your company's written termination policies are followed, which means consulting human resources or your immediate supervisor. After a decision is

Focus only on what is relevant and what has previously been discussed. You may feel like outlining every little transgression to bolster your case, but don't do it.

Also, avoid comments such as, "I hate to do this" or "I feel horrible about this." They only add salt to the employee's wounds. If the person is reasonable, allow some time for venting. Some human resources professionals suggest acknowledging the employee's frustration, but don't be drawn into an argument.

Finally, if the employee threatens to sue, don't freeze up. Ask for reasons and take good notes. They may come in handy later.

Remember, termination is a process that starts when an employee is hired. As Harvey Mackay, author of *Swim with the Sharks Without Being Eaten Alive*, wrote: "It's not the people you fire who make your life miserable, it's the people you don't fire."

Prencipe is an attorney in Springfield, Va., who prefers the gentler art of freelance writing on legal and employment topics. She can be reached at LWPrencipe@aol.com.

PROTECTING YOUR NET AFTER THE FIRING

Precautions to take when letting go of a network professional.

Protect access to all network — and even client workstation — disk drives at the root level.

Disable any passwords the employee had.

Change passwords of other network department employees.

Consider changing all user passwords.

Do not give the employee access to any system after termination.

Do not leave the employee unsupervised once he has been terminated.

caught sleeping on company time but provided a satisfactory explanation.

The court's message is clear: Be consistent in your reasons for firing people, and document everything.

It's no wonder that experienced and new managers alike get the willies when they have to fire an employee, especially someone more than 40 years old, minority or female. Wrongful discharge lawsuits can be brought to court under more than eight federal acts.

Even the "at will" employment relationship, in which an employee can be fired for any reason, not just "for cause," has been affected.

At-will employees have won

When firing, become a documentarian

If an employee threatens to file or files a wrongful termination lawsuit, to save the day you'll need good documentation, such as job descriptions, records of written warnings, summaries of conferences with the employee and written performance improvement plans. If you've been a little lax on paperwork and want to fire someone, don't rush. Take a minimum of 90 days to develop the documentation. Create a performance plan with measurable objectives and a definite time frame for improvement. Review it in detail with the employee.

Some managers may object to "baby-sitting" an employee who isn't working up to snuff. But sometimes, that's just what it takes.

A Sun Microsystems, Inc. manager on the verge of firing an inefficient systems engineer got results from taking time to detail the issues, says Rita Risser, attorney and founder of Fair Measures Management Law Consulting Group in Santa Cruz, Calif.

The manager sat the employee down, treated him like a first-year college student and expected nothing more from him than of a new hire. The manager now reports that the employee who had one foot formerly out the door is a star performer.

— Loretta Prencipe

The Fair Measures Web site can keep you up to date on employment law with its quarterly management newsletter, legal news and other information.



www.nwfusion.com

Tomorrow Dawns a Little Early at ANDERSEN WORLDWIDE

Information Systems Services (ISS), is a division of Andersen Worldwide. ISS plans, develops and manages the internal information systems for Andersen Worldwide's two business units, Arthur Andersen and Andersen Consulting. By partnering with them, we deliver the most advanced and appropriate computer and communications-based tools, facilities and data. Immediate openings are available for high-quality, motivated personnel to work in a variety of interesting and challenging areas.

All positions are located in downtown Chicago and require strong analytical and problem-solving skills, excellent written and verbal communication skills and proven ability and interest to learn new technologies. A BS/BA degree or equivalent experience required.

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The ideal candidate will have one year or more of in-depth Lotus Notes Systems Administration or previous experience as a Lotus Notes Administrator with Windows NT. The ability to assume ownership for the investigation and resolution to server problems. Responsibilities include software/hardware maintenance, upgrades for Notes servers and planning and recommending preventive maintenance for such.

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A minimum of 3 years experience installing, maintaining, supporting and migrating MVS operating system software in a multi-LPAR environment is required for this position. The ideal candidate will have a strong understanding of the MVS operating system and associated system software, including SMP/E, ISPF and MVS utilities. Experience with OS/390, MVS Open Edition and Unix is a strong plus. (Ref Code: 12AT-MVS)

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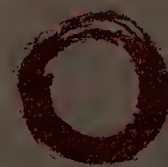
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Technical support for HNS' Installation and Inventory Distribution System, including enhancements, upgrades, interfaces and adhoc reporting, software tools, systems and implementation approach; lead application development projects. Experience in PowerBuilder and on ORACLE database, including SQL*Plus, Import/Export, and SQL*Loader. Familiar with LAN, including Netware & TCP/IP, DOS & Windows.

Systems Analyst (Germantown)

5-7 years of business application development experience. Design, code, test and implement new business applications and make modifications or enhancements to existing applications. Knowledge of Powerhouse, COBOL, Turbo Image database structures.

Oracle Developer (Germantown)

Design, code test and implement business applications, perform modifications on existing applications and lead application development of complex business-critical projects.

Software Trainer (Germantown)

Develop software applications related to Enterprise Resources Planning (ERP) System. Application and training staff will be centered around vendor-supplied material and tools. Skilled in course development, MRP and APICS certificate desired.

UNIX Systems Administrator (Germantown & San Diego)

Provide technical support and system administration for Engineering and Business systems in an HP-UX environment; provide planning development and implementation of system enhancements, administrative duties, and UNIX system troubleshooting. UNIX experience in an Engineering environment and a thorough understanding of system administration tools or performance monitoring tools, HP Open View, and SunNet Manager. TCP/IP, NFS, SMTP, PERL or X-Window. Experience with HP-UX and SunOS/Solaris desired. Windows NT experience also desirable.

UNIX Systems Manager (Germantown)

This hands-on manager will provide technical management and project/team leadership for UNIX systems and application support groups.

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Provide technical support of Netware and NT based LAN applications, NT desktop configuration and support, front-line support for internal customers. Solid knowledge of Windows NT and Windows 95. Experience with Microsoft products. Excellent customer service and communication skills essential. Knowledge on Netware 4.1, basic understanding of SPX and TCP/IP, and familiarity with Lotus Notes desirable. Must be able to lift 25 lbs., and able to work at Tijuana facility.

Department Coordinator (Germantown)

Provide support to ERP project team and various administrative duties. Strong PC skills, specifically in MS Word, PowerPoint and Vision.

Lotus Notes Engineer (Germantown)

Installation / testing of Notes hardware / software and providing detail NLM. Set-up remote communications, oversee and maintain data-bases and server applications. Unix and Novell LAN experience.

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Will develop the corporate Internet Intranet architecture. Requires a BS/MS in CS or related degree and 2-4 years of system development implementation experience. Requires programming experience in Java, HTML scripts, CGI, PERL, C/C++, application integration experience, firewalls, proxies, packet filtering, TCP/IP network and NT systems administration.

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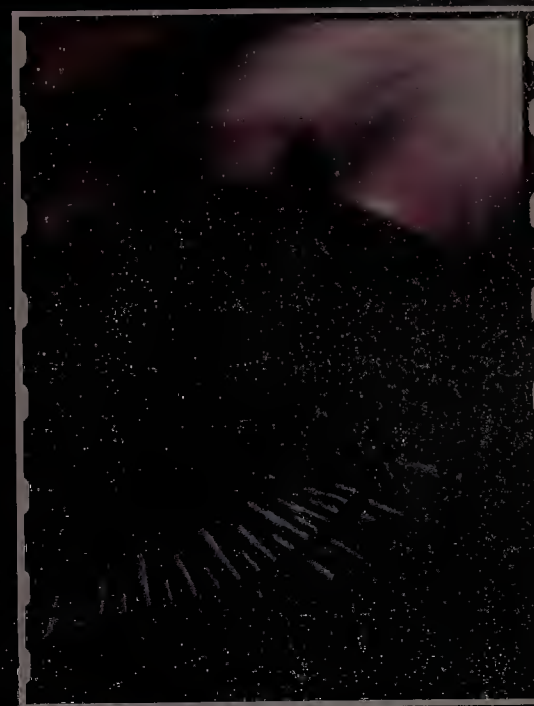
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Enterprise Customer Support Engineers (WA, TX and NC)

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Network: Requires 2+ years experience with multiple NOS's (NT, Netware, LANManager), Ethernet, Token Ring, TSP/AT, SMS, gateways, bridges, routers, network diagnostic tools, OSI Model, WANs and communication protocols. Prior experience as a Network Administrator desired.

Messaging/Internet Support Engineers: Requires 2+ years experience in networking architecture with NT, Netware, LANManager, Banyan Vines or UNIX. Asynchronous communications skills and knowledge of VB programming preferred. Mainframe or mini-computer networks, and enterprise/work group message systems experience is a plus. A strong understanding of the Internet, experience with Internet Explorer, Internet Information Server, and intranet administration are desired.

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Requirements: Minimum 2 years' experience providing technical solutions to customers and extensive experience with LAN/WANs, routers/bridges/hubs, ATM, frame relay, IPX/SPX networks and compressed video. Degree in related field and sales engineering experience preferred. **Job Code: SED/DG**

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Sales Engineer - Voice/CPE Applications

Provides support to sales and service personnel through technical consultation, design and development of implementation detail on applications comprised of Voice/CPE products and services.

Requirements: 3-5 years' experience in the engineering, installation or technical support of Voice/CPE applications and solutions involving NTI, NEC and/or OMNI. Degree in CS, EE or Math and experience in various customer environments with a strong knowledge of switching network and a solid understanding of competitive offerings also required. **Job Code: SEV/DG**

Sales Engineer - BICS

Provides support to sales and service personnel through technical consultation, design and development of implementation detail on structured wiring products and services.

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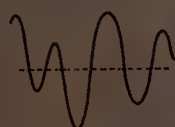
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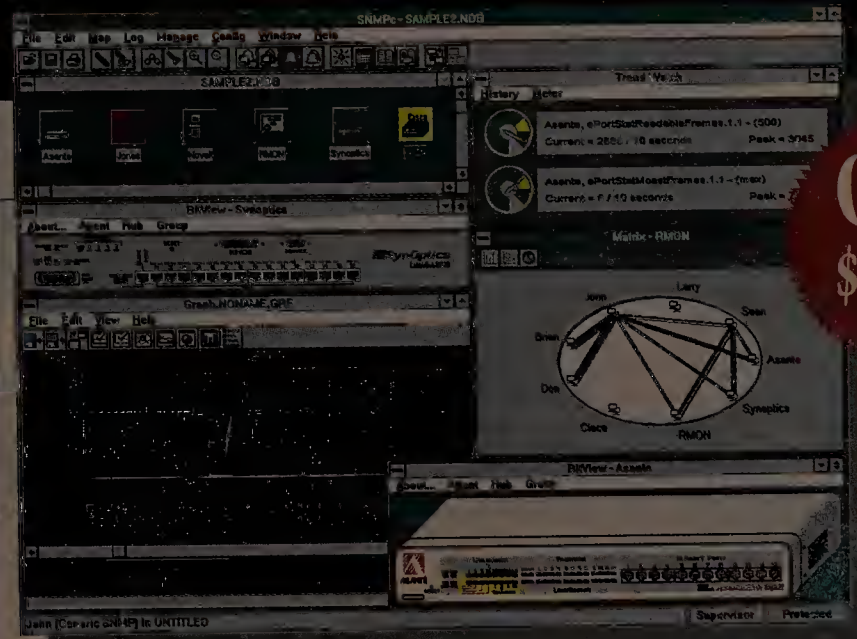
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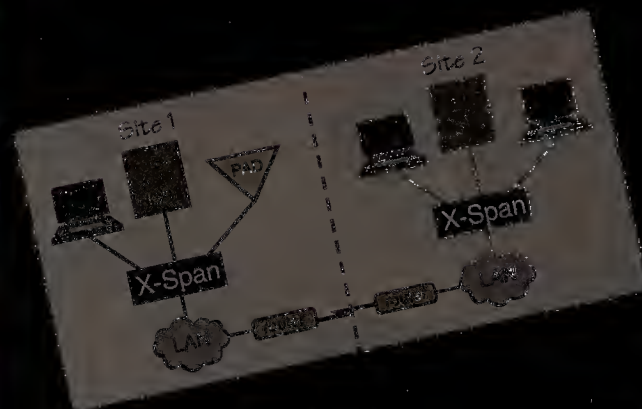
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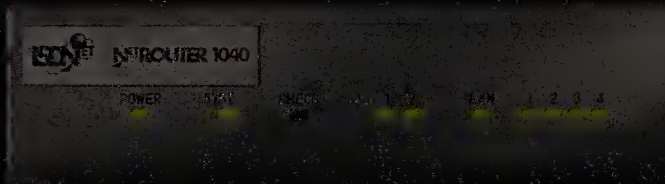
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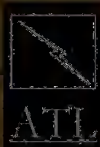
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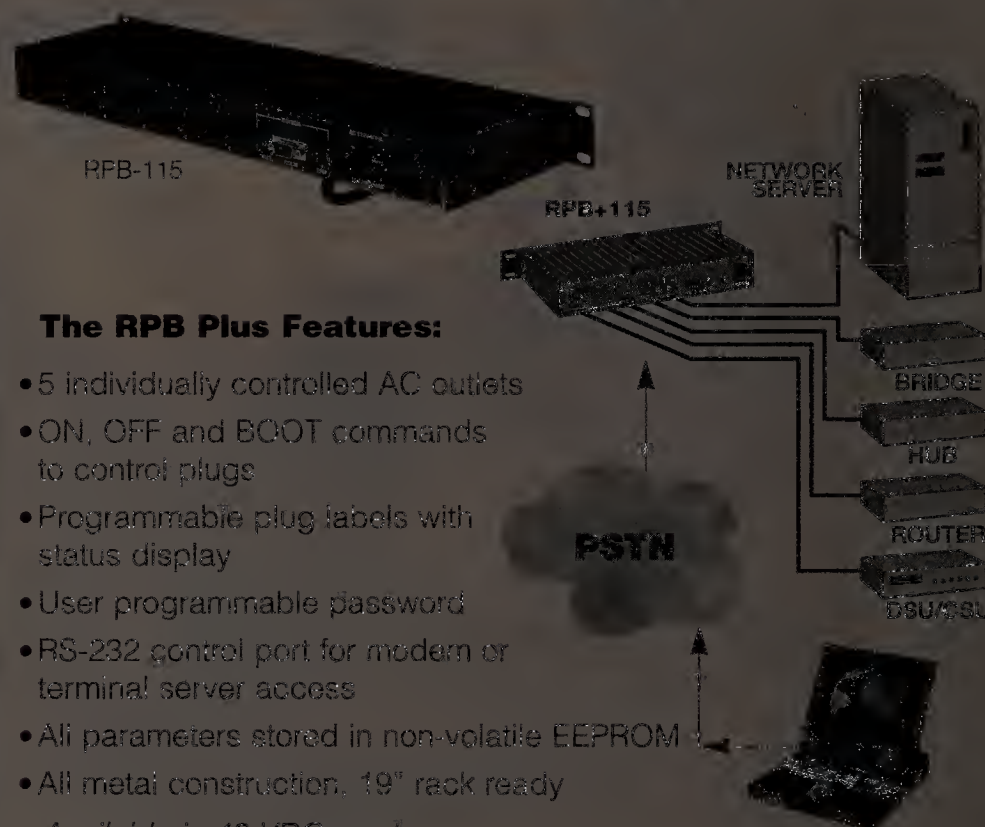
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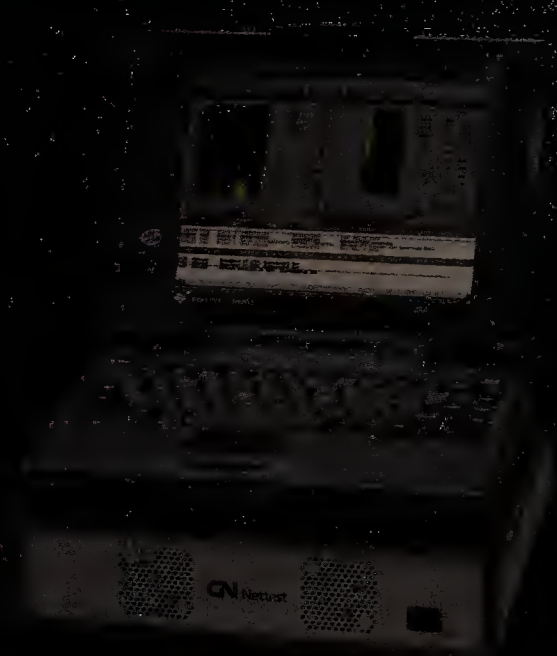
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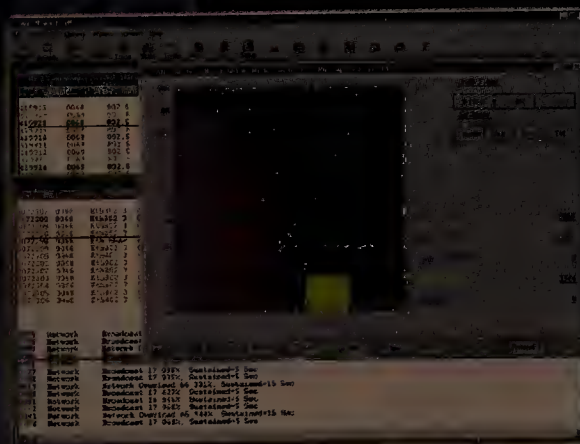
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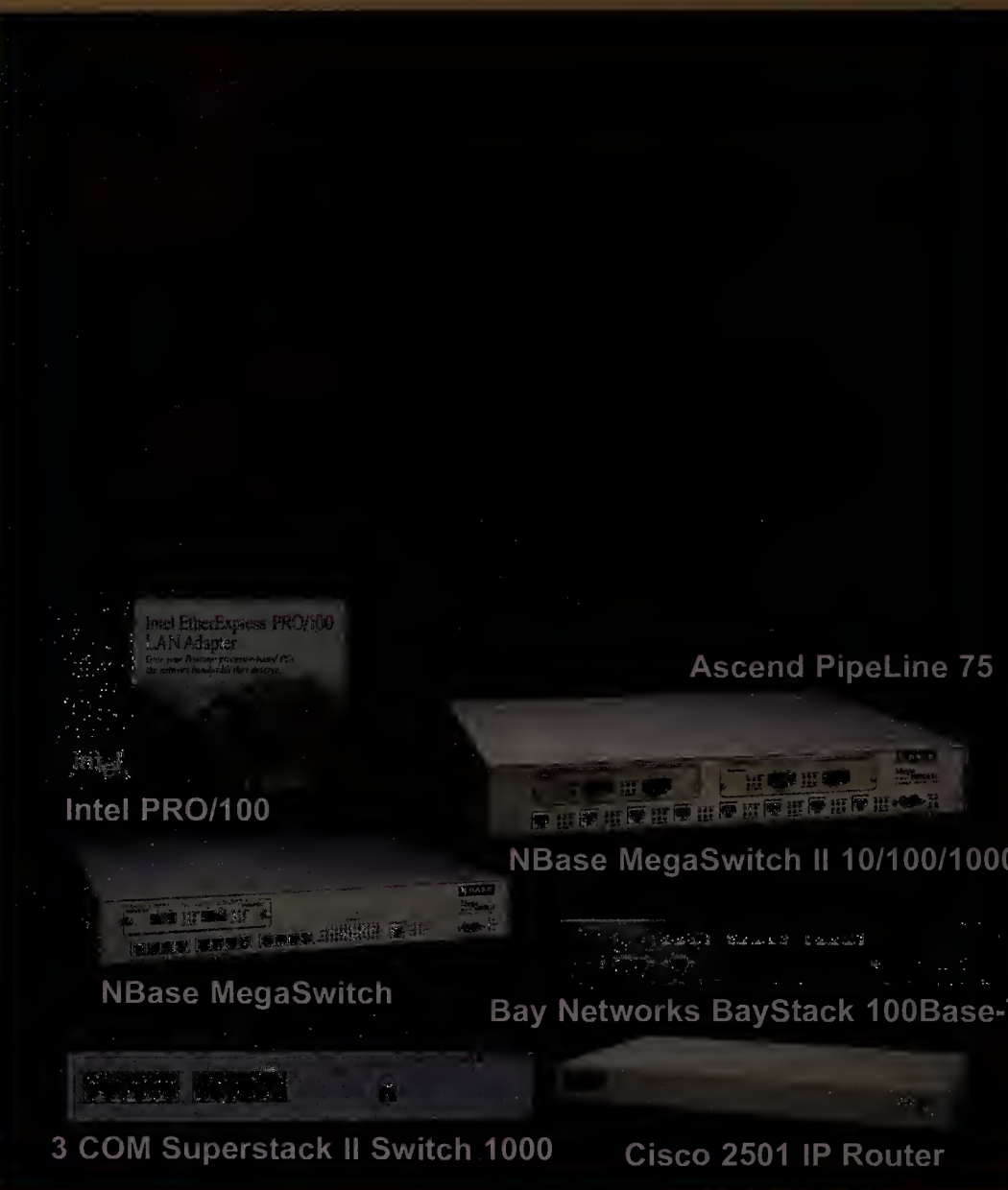
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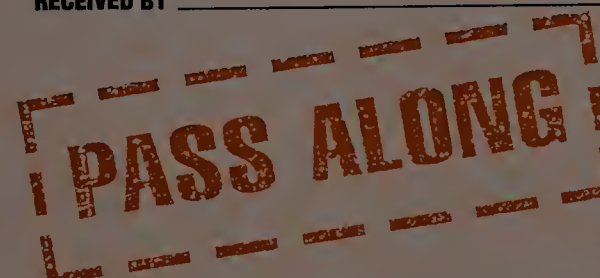
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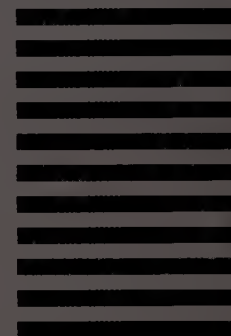
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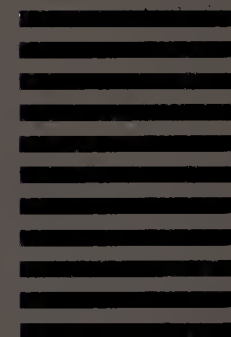


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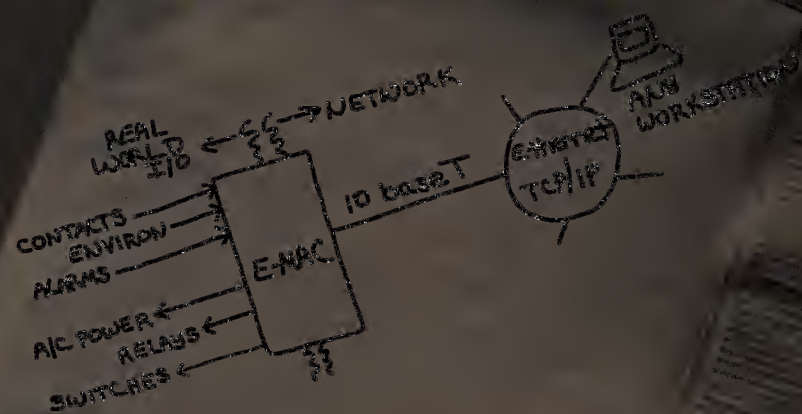


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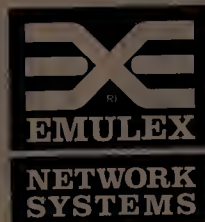
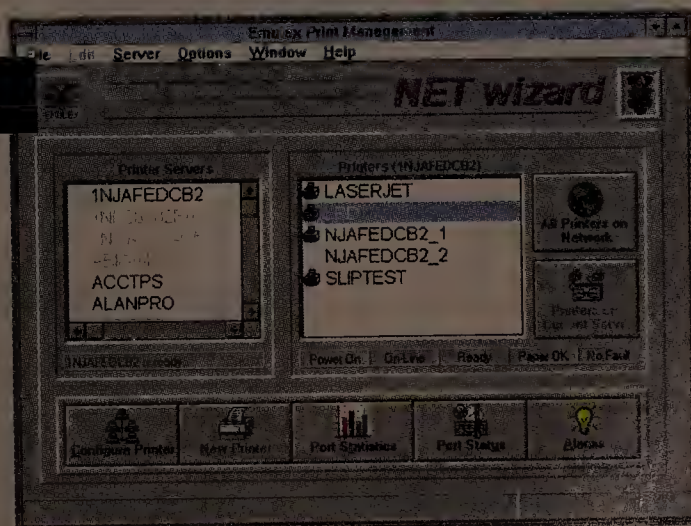
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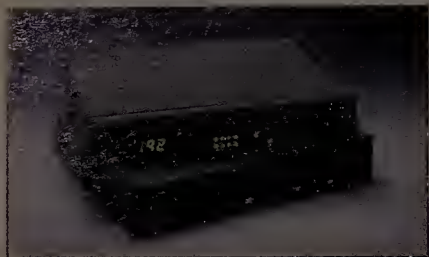
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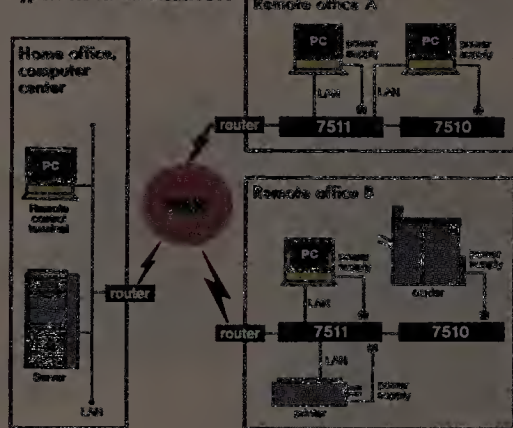
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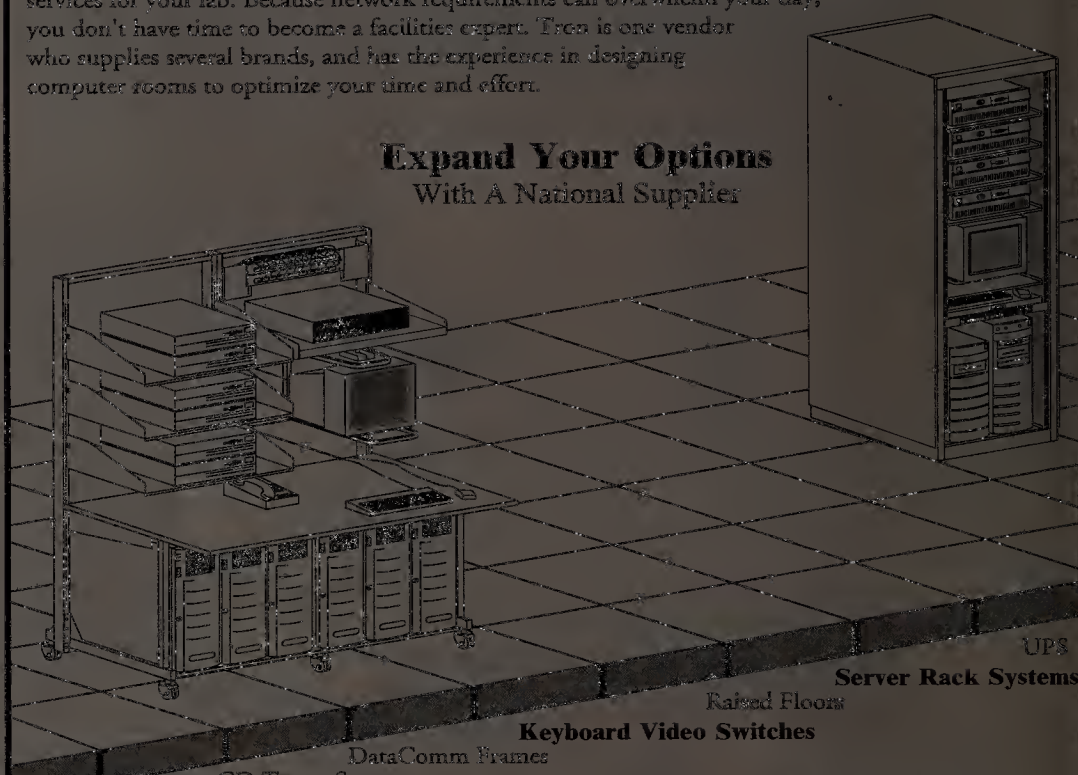
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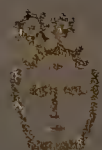
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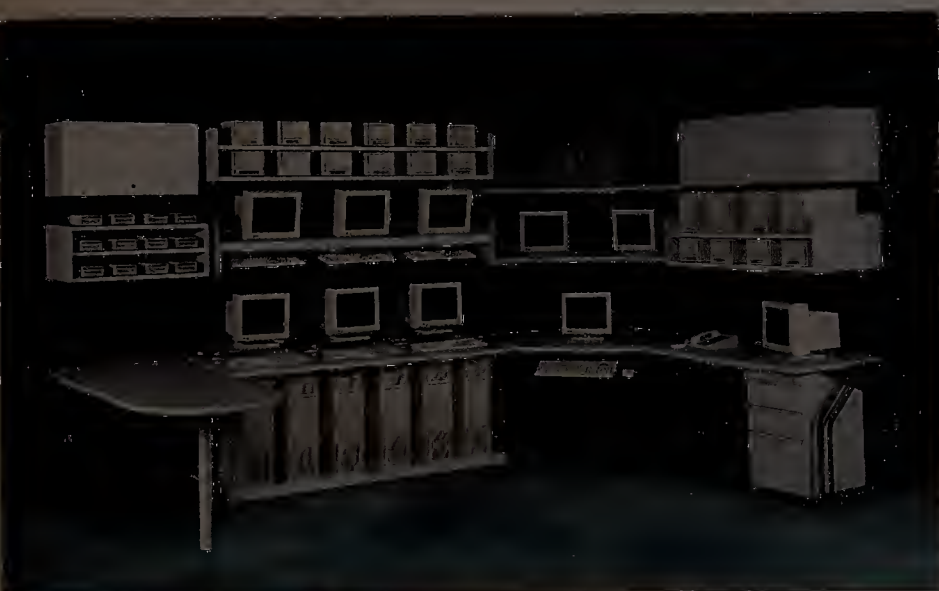
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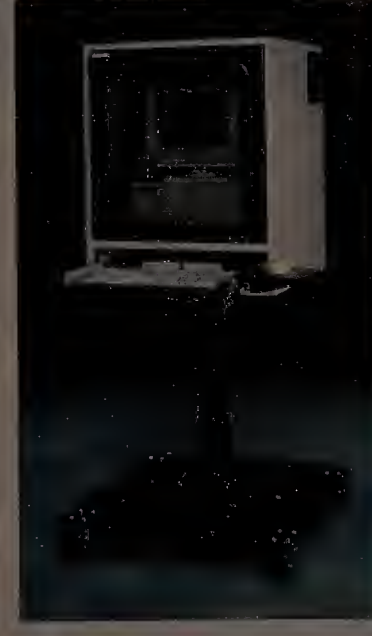
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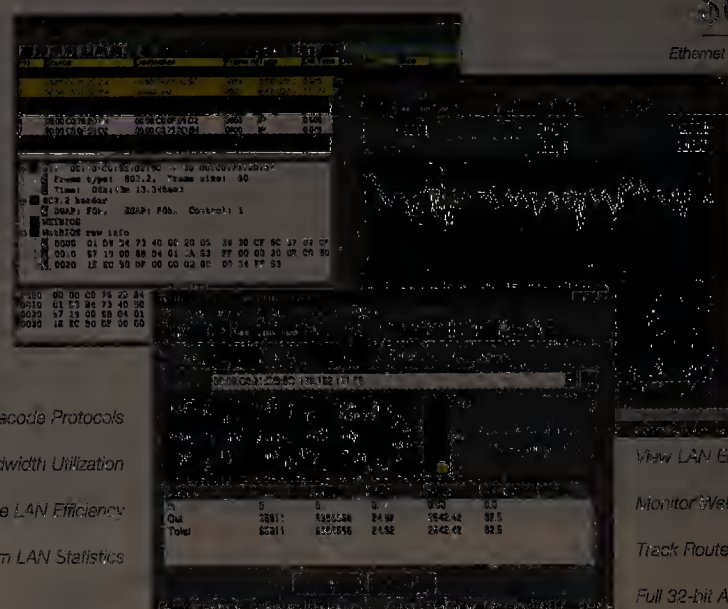
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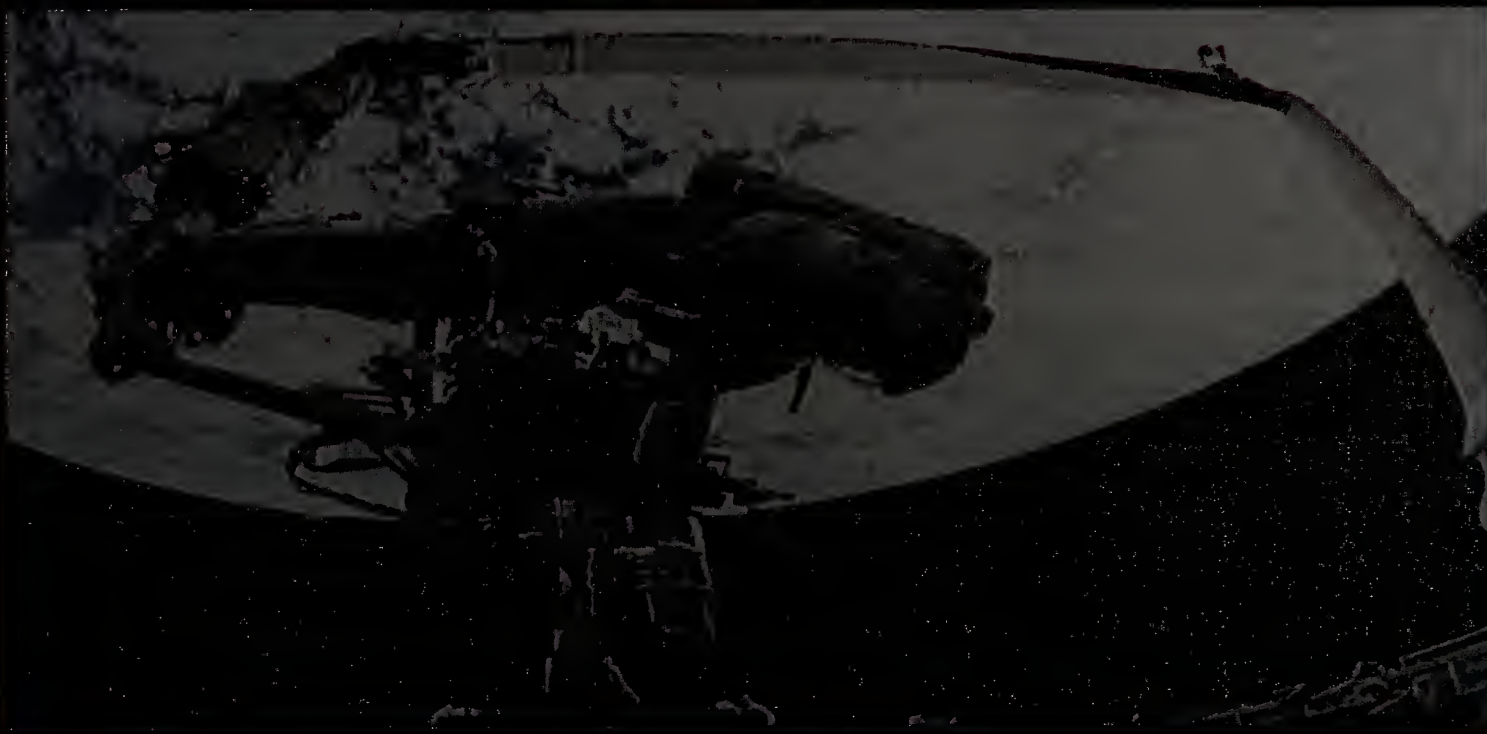
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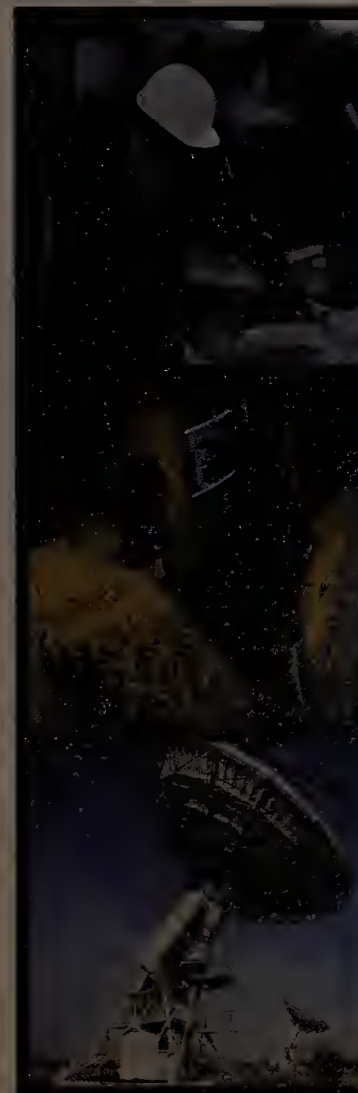
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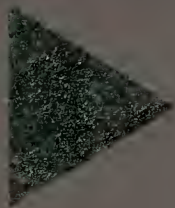
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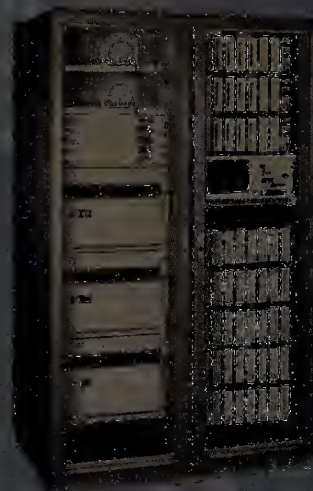
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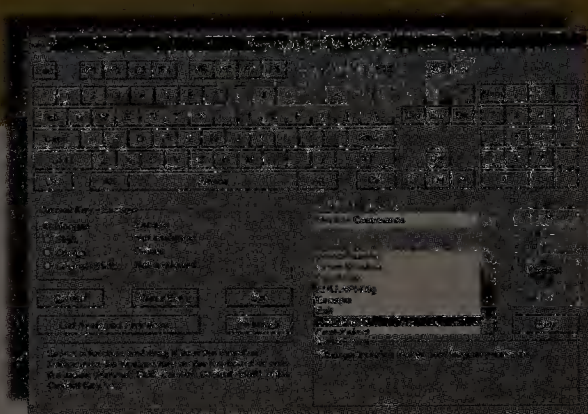
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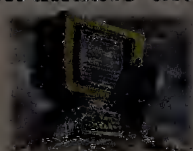
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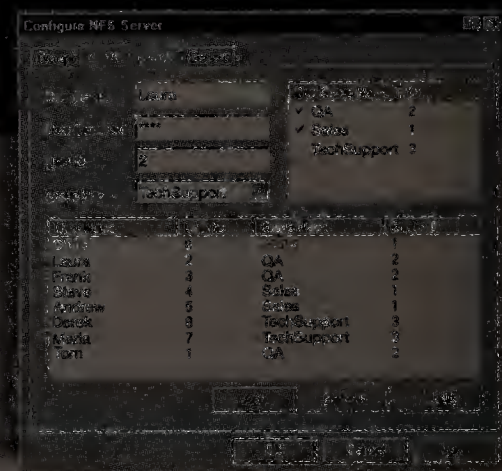
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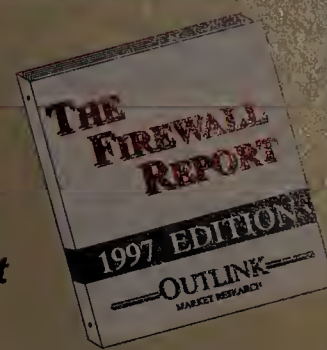
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NIA

Continued from page 1

ronment, and unless all of those vendors participate in the NIA, it doesn't do much for me."

The NIA's credibility is also in question because the group has reversed its stance on ATM routing and, according to some members, backed off plans to define a framework for interoperability. Analysts also said NIA companies lack unity.

And in an indication of just how unimportant this group may be, some companies listed as members on the NIA Web site claimed they are not members at all. Also, one high-ranking Bay official said the NIA is not addressing what customers want.

All this is transpiring while the NIA maintains a consciously low profile. Meanwhile, analysts poke away at the group, looking for signs of life.

"[The NIA has] a very low pulse," according to Nick Lippis, president of Strategic Networks Consulting, Inc. in Rockland, Mass., who has overseen some of the NIA's testing at the University of New Hampshire in Durham. "The NIA has not taken the industry by storm, it's not making a major impact in purchasing decisions, and the overall effectiveness has been marginal, at best."

NIA's reason for being

Just what is the NIA's raison d'être?

The group burst onto the scene May 20, 1996, with much fanfare, as chief executives from the three founding companies rammed a stake into the ground for open, interoperable networking. The group assembled to help users simplify, standardize and enhance LAN deployment through open, common product interoperability specifications and testing.

The NIA is seeking to ease integration of desktops with the edge and core of the network, areas where founders 3Com, IBM and Bay have market leadership or a sizable presence.

The NIA said it would achieve its objectives by defining an open "system framework" of standards by which vendors could test their products for interoperability. This framework would include "key" technologies from the three founders' switched internetwork architec-

tures: 3Com's interpretation of the IEEE 802.1p and 802.1q virtual LAN standards, Bay's work on Integrated Private Network-to-Network Interface (IPNNI) for ATM routing and IBM's zero-hop routing for interconnecting subnets.

The group would also conduct interoperability testing and submit specifications to standards bodies for industrywide adoption.

Since its formation, the group has completed a couple of ATM interoperability tests on equipment from the founders and four other "members" — First Virtual Corp., Madge Networks, Inc., U.S. Robotics, Inc. and Xylan Corp. The NIA has two more tests planned for this year.

Other than that, things have been quiet. The NIA is not very proactive about publicizing its work. That may be because

the company's NIA representative.

Bay said the NIA is updating the framework, but focusing more on interoperability testing. When it comes to testing, the founders are all upbeat on what they have accomplished, but analysts are split on the impact.

One of the by-products of the testing is the NIA companies are now familiar with one another's products, said Lyndon Ong, product development manager at Bay. "As customers come to us with interoperability problems, we have the right contacts and experience to go out and quickly identify what the problems are."

But there is still a long way to go. The tests did not include 802.1p and 802.1q, IPNNI and next-hop routing — the technologies cited by the founders as key to their original goal. The reason for this, Ong said, is that these technologies are not stable enough yet to be implemented in products; the NIA only tests shipping products, he said.

Then there is the issue of IPNNI and its alternative, Multi-Protocol Over ATM (MPOA), or the "exploded router." Last year, the NIA said MPOA was complex, difficult to push through the standards process and "not critical to this alliance." Now that MPOA has progressed further through the standards than IPNNI, the NIA is singing a different tune. And at least three NIA firms are participating in an MPOA interoperability demonstration at NetWorld+Interop 97 this week (see story, page 37).

"There's definitely a feeling that [MPOA] is an area that we're going to want to include in our testing in the future," Bay's Ong said.

Ong said the updated NIA framework will include MPOA. But 3Com has not exactly embraced MPOA.

In an interview with *Network World* earlier this year, Floyd Backes, director of product and strategy architecture at 3Com, said he is not going to base 3Com's strategy on MPOA, although the company will support it if customers want it.

"MPOA makes things way too expensive because it requires all the functionality of a Layer 3 router in the wiring closet,"

Backes said. "Edge devices need to be cheap, which is why we like [3Com's] Fast IP."

Analysts said this shows a lack of unity among NIA members.

"[The NIA] is not exactly what the customers are looking for."

Bill Howe, VP of architecture, Bay Networks

"It seems like different groups within [the NIA] are operating independently," said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo.

Indeed, NIA seems to be a low priority or afterthought with some "member" companies. Madge claimed it is not a member of the NIA even though the NIA Web site indicates that it is. And First Virtual said it became a member because it has business ties with Bay and IBM.

Even a high-level Bay official

questioned the NIA's intent. Bay's Vice President of Architecture Bill Howe last month told *Network World* the group has "drifted" and is not "exactly what the customers are looking for."

What could save the NIA? Broader membership that includes Cisco, and a branding and certification program.

"The true tale of success would be when companies sending out RFPs require NIA-compliance as a check-off item. But they're so far away from that," Lippis said.

Indeed they are. NIA officials said branding and certification are not near-future goals. They insisted that their group is open to all comers, including Cisco.

Cisco, meanwhile, said the NIA's efforts are redundant with those of other standards groups. Also, Cisco has heard no demands from users to join the NIA, a Cisco spokesperson said. ■

NIA accomplishments to date

Objective	Status
Define a system framework for interoperability	Conflicting answers. IBM says it's complete, but 3Com says it's been scrapped. Multi-Protocol over ATM, deemed "not critical to alliance" a year ago, will be addressed.
Conduct interoperability tests	Two completed, two more scheduled for this year. No interoperability testing has been done yet on what the NIA termed "key technologies" upon its inception: IPNNI, 802.1p and 802.1q, and zero-hop routing.
Submit specifications to standards bodies	Done on an individual company basis. No NIA specs will be submitted.

the stake it put in the ground last year has loosened up considerably.

Is there a framework or not?

Depending on who you talk to at the NIA, the system framework is either complete or in the trash. IBM said the interoperability testing done to date was based on the framework.

"Not only was it important that [testing] was operating within the framework that was defined, [but testing had to go beyond the framework since] many of our customers have variations of that or are not in a pure environment as such," said Lauri Gibson, business executive for strategy and alliance at IBM, and the company's NIA representative.

But 3Com says the framework was abandoned.

"As we expand the membership of the NIA, it better serves the customer to focus on interoperability more than creating an overarching framework," said Mike Bergines, manager of systems marketing at 3Com and

Remote

Continued from page 1

using an 800 line.

Concentric offers all the necessary hardware and software for a remote access system. That includes a Bay Networks, Inc. AN router, a CSU and a dedicated connection to Concentric's ATM backbone. RemoteLink customers have the option of letting Concentric procure and install the hardware and software components or doing it themselves.

For security, the service comes with Funk Software's Windows NT-based Steel Belted RADIUS server. RADIUS is a standards-based centralized verification and access control system for remote dial-in.

The RADIUS servers are deployed at a customer's headquarters where it is easier for network managers to update their authentication database when necessary. "It's key to give users the ability to change an employee's dial-in status, as well as maintain IP addresses," said Dan Taylor, senior analyst at the Aberdeen Group, a Boston-based consulting firm.

Although Concentric is an ISP, RemoteLink traffic will never travel over the public Internet, said Jim Hietala, product manager at Concentric. Instead, it travels over Concentric's ATM backbone. For added security, the ISP uses Bay's Baystream Dial-in VPN Service. The service is based on Mobile IP, a

Layer-3 tunneling protocol that enables Bay routers to dynamically set up and tear down secure IP tunnels between a dial-in user and the corporate network.

RemoteLink's client software includes CityFind, Concentric-developed software that locates the closest local access dial-in number to Concentric's network. CityFind eliminates the need to set up a dedicated toll-free number for remote users.

Toll-free numbers can cost as much as \$6 per hour, Taylor said, whereas RemoteLink costs \$1.88 to \$2.55 per hour.

Other carriers offer tunneling and firewall services, but Taylor said no other ISP is making such a concerted effort at supplying dial-in users a secure and cost-effective connection to corporate networks.

Concentric charges a one-time installation fee of \$3,000. The Windows NT-based RADIUS server running Funk's authentication software costs \$14,000. The ISP also provides a Bay AN Router for \$1,995 and a CSU for \$995.

The RemoteLink service will debut at NetWorld+Interop 97 and is expected to be available by the end of the month for \$750 to \$2,500 per month.

Senior Writer Tim Grimes contributed to this story.

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Ramp Networks

Continued from page 1

coming about details, sources described an approach in which individual network devices connect to one of four Ethernet ports in a WebRamp M3 chassis and can command one, two or all three of the 56K bit/sec modems integrated in the

same box.

If two or all three modems are called into play, they call the Internet service provider simultaneously, attack Web pages as a team and share in the downloading, resulting in throughput up to 156K bit/sec, sources said.

The system exploits the basic nature of Web page downloading. Pulling up an

average Web page with graphics involves multiple TCP/IP sessions, and those sessions must be established sequentially.

But with three modems working simultaneously and establishing unique sessions, download time can be cut by as much as two-thirds.

The ISP does not have to do a thing, sources claimed. And the modems will

kick down to regular V.34 speeds if the ISP is not equipped with compatible 56K bit/sec modems. The modems' top speed is approximately 52K bit/sec under ideal conditions, putting the WebRamp M3 limit at 156K bit/sec.

While users would get faster speeds, there could be drawbacks.

"I'd love it, as long as my Internet service provider allows me to log in with my user ID and password for three simultaneous sessions," said Jeff Banks, technical support manager for Northwest Multiple Listing Service, a real estate service agency in Kirkland, Wash.

Banks runs a dial-up database for realtors supported by 300 modems, so he said he could sympathize with ISPs. "I wouldn't want one user tying up three phone lines," he said. His guess: an ISP would charge more to let users do that.

PROFILE: RAMP NETWORKS

Based: Santa Clara, Calif.

Founded: 1993 as Internet Systems; name changed this year

Primary products: WebRamp Internet access devices for small offices

Management: Richard Teerlin, president, CEO and founder (founder of Aerobically, Cary, N.C., was president and general manager for many of GTE Spacenet and USN Communications)

Financials: Not disclosed

Employees: More than 60

According to Jim Bryce, author of *Using ISDN*, in some areas of the country a 128K bit/sec ISDN Basic Rate Interface line could cost less than three analog lines, especially if they were business lines.

In Austin, Texas, where Bryce lives, for example, three lines cost \$90 per month and BRI ISDN costs \$70.

In other places, where usage fees are levied for ISDN, it could cost more. It is a close call, Bryce said. That cost differential could get worse if the Federal Communications Commission follows through on a plan to boost business-line costs \$4.50 per month (NW, April 28, page 8).

Bryce also said set-up times for ISDN are much faster than those for analog modem calls.

In addition to mating the modems, WebRamp M3 is an IP router and four-port Ethernet hub, allowing multiple users to share the modems. As many as three users could use individual modems to call different destinations. And if no one else is using the modems, a single user could opt for one, two or three modems simultaneously.

Ramp, formerly Trancell Systems, Inc., would not discuss availability or pricing.

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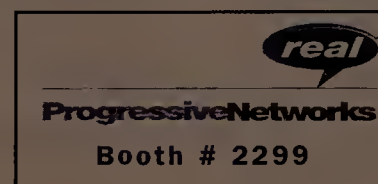
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WEB WATCH: PART TWO

Second in a series

Start-ups seek formulas for success

By Chris Nerney

It's one thing to come up with a product; it's another to sell it. That's the big task facing HAHT Software, Inc., BackWeb Technologies and Novera Software, Inc. as the three Internet start-ups fight for supremacy — or at least profitability — in their respective markets.

The decisions these and other high-tech start-ups make can ultimately shape the course of technology, as well as the products and service options available to network managers like you.

In the second installment of Web Watch, we look at what these three companies have been up to since we introduced them in January (NW, Jan. 13, page 44).

Nor many software start-ups would dare challenge industry colossus Microsoft Corp. head-on. Most companies are willing to settle for a market niche limited enough to keep them off Bill Gates' radar screen.

HAHT SOFTWARE, INC.

HAHT Software, however, is going mano a mano with the Northwest software giant in the potentially huge Internet application development market.

Since Microsoft launched Visual InterDev 1.0 in March in direct competition with HAHT's HAHTsite 2.0, the two-year-old start-up has aggressively invited comparisons between its offering and Microsoft's. Go onto HAHT's Web site and you'll find a prominently placed link that reads: "Considering InterDev? You should consider this." Click on it and you get a detailed comparison showing InterDev's shortcomings relative to HAHTsite as a comprehensive application development tool kit.

This showdown strategy, of course, is part bravado, part shrewd marketing and part necessity. After all, it's hard to pretend an 800-pound gorilla doesn't exist, especially when it stomps onto your turf.

Nonetheless, since January, HAHT seems to have positioned itself as well as any start-up could to do battle with Microsoft in a single market. HAHTsite 2.0 has garnered a steady stream of rave reviews and

awards in the trade press, raising the company's profile considerably in just a few months.

HAHTsite 2.0 is an open tool set designed for corporate server-side application developers and sophisticated Web content creators. It consists of an application server, a software development kit and an integrated user interface.

HAHT officials say that unlike limited "point" Web authoring tools that offer content creation, database access, site management or programming languages, HAHTsite 2.0 offers users all of these. It provides development teams with different tasks one common application platform.

"We eliminate the baling wire, chewing gum and tape that most people have to use to put up a Web site," says HAHT

President and CEO Richard Holcomb.

Holcomb says Microsoft's decision to sell an application development tool kit for Web sites helps his company by further validating the market, which Forrester Research, Inc., a Cambridge, Mass.-based consultancy, estimates will hit \$1.2 billion by 1999. "The press and analysts now understand there's a different category of product, there is a category for building applications over the Web," he says.

That awareness is filtering down to potential customers, Holcomb says.

"We're not missionary anymore," he says. "We don't have to explain to people that there's a difference between a Web application and just a bunch of Web pages."

But this doesn't mean that the market is ready to

wholeheartedly embrace integrated Web application development environments. "We have not reached a point in the market now where everybody's going to have one and it's just a choice of whether it's going to be a Ford or Chevrolet," Holcomb says.

And while HAHTsite's customer base is broad — "Every business known to man," says Holcomb — the company's greatest success has been with customers

ACTIVITY
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haht
SOFTWARE

HAHT SOFTWARE: 1997 ACTIVITIES TO DATE

- Shipped HAHTsite 2.0, a new version of its flagship product, in February.
- Announced HAHTsite Integrated Publisher, an application software tool kit for Web content and design developers, in February.
- Increased the price of HAHTsite 2.0 in April.
- Added nine members to its reseller program.

that have a sense of urgency.

"If we hit a customer who's thinking about the Web, looking at tools, evaluating . . . they're going to buy something eventually, but they're not sure when," he says. "And you really can't push them."

So far, HAHT counts among its customers AT&T, Ciba Geigy, Ltd., the city of Phoenix, Walt Disney Co., and the U.S. Postal Service.

Holcomb says he's not prepared to release sales figures but estimates HAHT is increasing revenue by 10% to 20% each month.

HAHT intends to release a new version of HAHTsite every six months or so, which means a 3.0 edition should be out this summer.

In the meantime, new customers will pay more for HAHTsite 2.0 following a price increase that went into effect April 1, which raised the total cost from approximately \$4,200 to nearly \$7,000. Holcomb says he and HAHT cofounders Jim Hebert, Rowland Archer and Tyler Bennett concluded they were underpricing the software.

Despite HAHT's apparently solid position in the market and favorable word-of-mouth reviews, the investment climate since last summer's Internet IPO crash has made fundraising more challenging in 1997.

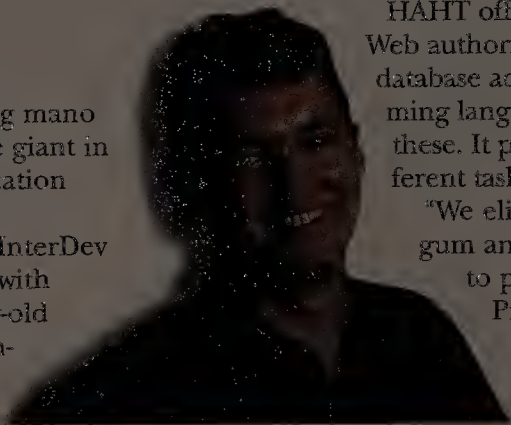
"Last year, we had a lot of people offering to give us money," Holcomb says. "This time, we have to go out and look."

B

San Jose, Calif.

y almost all accounts, BackWeb Technologies has earned a spot as one of the name players in the crowded and hyperactive push technology market.

The company trails PointCast, Inc. and Marimba, Inc. in mindshare and industry press clippings, but aggressive marketing and a new high-profile partnership with Microsoft Corp. have helped BackWeb to put itself on the short list of companies mentioned when the talk turns to push.



"The biggest factor for us in whether we make a sale is whether the customer has a well-defined project with a deadline."

Richard Holcomb, CEO, HAHT Software

And that's just where the company wants to be when the widely expected push shakeout begins, says Kelsey Selander, BackWeb's vice president of marketing. "A part of our game plan was to be one of the three companies on top when the market went to consolidation," she says.

The market may not be at that point yet. Although one vendor, IFusion Com Corp. of New York, filed for bankruptcy in early April, the number of start-ups climbing aboard the push bandwagon continues to grow and now totals more than 50 by some estimates.

Push technology enables users to have information sent to them over the Internet or intranets, as opposed to seeking out data online via their browsers. BackWeb's software enables Web site owners to create personalized Internet "channels" to deliver content to desktops. Key to the BackWeb pitch is its Polite Agent technology, which allows information to be downloaded without disrupting other applications.

BACKWEB TECHNOLOGIES

Since January, BackWeb has almost tripled the number of channels it offers from 28 to 80, and many of those channels are for corporate intranets.

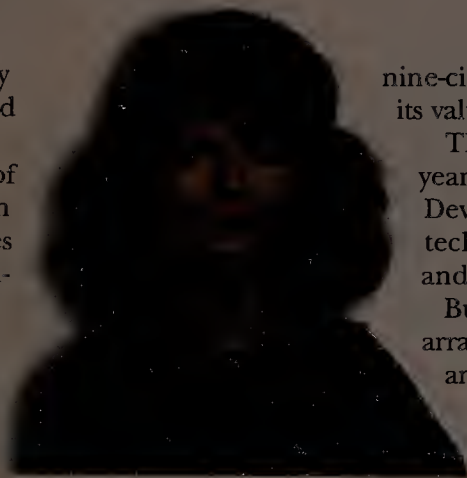
Growth has come in other areas, as well. BackWeb began the year with 60 employees and now has more than 80, including new Chief Technology Officer Hubert Delany, who left Gartner Group, Inc. last week to join the start-up.

Selander says it is a daunting task to integrate so many new employees into the fast-paced culture of a start-up that is also trying to expand its customer base and product line. "Scaling has been the biggest challenge we've faced as a company," she says.

In late March, the company announced a beta version of BackWeb 2.0, adding new file compression capabilities to further minimize bandwidth usage and a software development kit to help companies integrate BackWeb clients with their applications.

BackWeb also unveiled a beta release of BackWeb Proxy Server, essentially a giant channel cache for organizations or ISPs with many BackWeb users.

Meanwhile, the company has reinvigorated the marketing campaign that first raised its visibility last fall. BackWeb continues to make itself a prominent fixture at Internet trade shows and has embarked upon two



"The whole point behind push is to send information people are especially interested in."

Kelsey Selander, vice president of marketing, BackWeb

nine-city road tours since January to promote its value-added reseller program.

Then there are the partnerships. Late last year, the company struck a deal with Lotus Development Corp. to package BackWeb technology with Domino, Lotus' E-mail and groupware server for the Internet.

But most significant, Selander says, is the arrangement with Microsoft the company announced in March. BackWeb will create a version of its push client explicitly for Internet Explorer 4.0, which Microsoft plans to release this summer.

The deal counters a similar pact between Netscape Communications Corp. and BackWeb's chief rival in the push software market, Marimba.

Several push competitors expressed concern last week that Microsoft and Netscape would eventually take over the market,

but Selander says BackWeb can stay in the game by offering added value to Microsoft.

"We need to innovate very well on top of [Microsoft] [channel definition format] platform," she says.

Selander says she doesn't begrudge PointCast and Marimba the hype they have generated in the trade and mainstream press, arguing that the publicity has helped promote push technology.

"As a long time marketer, I know that any one of us alone could not have gotten as much press," she says.

F

Burlington, Mass. focus on the first 25.

That is the strategic mantra being recited by Novera Software executives as they launch the start-up's Java-based operating system.

By getting its first 25 customers up and running with Enterprise Platform Internet Computing (EPIC 1.1), CEO Herb Rush says the company will build a solid revenue base and create positive word-of-mouth advertising.

NOVERA SOFTWARE, INC.

Of course, Novera is not looking for just any old customer. The company is going after the biggest IT shops it can find, such as those at financial services institutions and utilities — the kind of organizations that have industrial-strength network needs.

Rush and the other Novera executives are confident that the company's EPIC 1.1 software is up to the task. The product, priced at \$7,500, began shipping March 15 and is the start-up's first "revenue release," according to Rush.

Originally, Novera touted EPIC as a Java-based applications platform. But in February, company executives began repositioning EPIC as a network operating system that complements other operating systems.

"We always knew it was an operating system because a lot of EPIC's functions, such as management and security, were traditionally part of the operating system," Rush explains. "But technology of this scope and breadth coming out of a small company can be a little bit scary, so we needed a phrase that would describe it as cleanly and quickly as possible."

Regardless of whether Novera calls EPIC an operating system or an application platform, the server soft-

ware is designed for developing and deploying Java business applications that run across corporate intranets and the Internet.

EPIC serves as a platform for a company's Java applications, allowing client and server applications access to directory services, file and print services, the Internet, E-mail gateways and relational databases.

EPIC also lets developers create custom services on the network, says Michael Frey, Novera's director of systems engineering. For example, a human resources department could use EPIC to put a company's 401(k) information online so employees could track their investments.

Novera is fighting for a share of a potentially lucrative market, focusing particularly on customers installing thin clients. So far, the market has been a pretty open field. Skunk Technologies, Inc. of Santa Monica, Calif., announced a Java-based operating environment in March, but Rush says fellow start-ups do not concern him.

"We worry about the JavaSofts, Microsofts and

ACTIVITY
1997
REPORT

NOVERA

NOVERA SOFTWARE: 1997 ACTIVITIES TO DATE

- Opened Wall Street office in January as part of its Fortune 500 sales strategy.
- Announced Novera EPIC 1.1, the first release designed for corporate intranets, in March.
- Began shipping EPIC 1.1 in mid-March.
- Announced support of JavaSoft's Java Naming and Directory Interface API.

Netscapes," he says. "At this point, we don't see anything that makes us particularly nervous. But it's better in this industry to be paranoid."

A big part of Novera's sales strategy is to target customers that are pre-sold on Java. According to Tim Hamilton, vice president of sales, "We're going behind Sun."

Small wonder, for widespread market adoption of Sun Microsystems, Inc.'s Java is critical to Novera's growth.

"We are completely, wholeheartedly dependent on Java," Rush says.

Unfortunately for Novera, Java requires customers to scale a steep learning curve. "If I look at why we're not deployed at 100,000 seats at a Fortune 100 company, it's because [customers are] learning how to deal with Java," Rush says.

As Java becomes an integral part of corporate intranets, Novera will expand beyond its Sun focus, says Richard Reichgut, Novera's director of business development. "We see ourselves hopefully doing the same thing with Netscape, IBM and eventually Microsoft — as strange as that sounds — now that [Microsoft seems] to have really turned around about Java."

Go online for our earlier articles about these companies.

1 8 2 1

ACTIVITY
1997
REPORT

BACKWEB TECHNOLOGIES: 1997 ACTIVITIES TO DATE

- Began beta-testing SecureCast with McAfee in January in an effort to push antivirus technology to desktops.
- Launched beta version of Yahoo! BackWeb Channel Guide in February.
- Announced a beta version of BackWeb 2.0 in March.
- Announced a partnership with Microsoft in March to supply broadcast channels for Internet Explorer 4.0.

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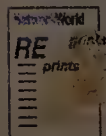
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Peer

Continued from page 1

and traffic overloads at these exchange sites is often cited in apocalyptic reports about the meltdown of the Internet.

In establishing private peering arrangements, the ISPs are, in essence, side-stepping the NAP problems. Deploying links of T-3 (45M bit/sec) and above, the carriers can minimize traffic hops and improve reliability and response times.

"Peering offers end users a higher grade of services because the network is better controlled," said Robert Hagens, director of Internet engineering at MCI.

Private peering started in late 1995 but is taking off today. MCI is leading the way with more than 30 peering agreements. Sprint trails MCI with half as many private links, but has a leg up on UUNET Technologies, Inc., PSINet, Inc., BBN Planet and IBM Global Network.

ISPs typically establish direct connections in pairs, splitting the responsibility for managing the connections. They use a common routing protocol, called the Border Gateway Protocol Version 4, that is a standard for communication among network providers. The protocol lets each ISP know if there is a line failure, what route is available and where the traffic will be sent.

Analysts and ISPs agree that private peering offers a more reliable method of exchanging traffic than the NAPs — primarily because ISPs do not have much control over what happens at those sites. ISPs can quickly reroute traffic and fix a problem when it crops up on their dedicated links, but they are at the mercy of a third party if a router or a dedicated link goes south at the big hub sites.

"This is a trend born of necessity," said Alan Taffel, vice president of marketing and business development at UUNET. "Our traffic load is doubling every three to four months. In fact, all ISPs are seeing this type of traffic growth. We pulled out of the MAEs to help the Internet."

While private peering was developed by ISPs to prevent roadblocks on the Internet, the dedicated connections seem to be

logical steps toward QoS guarantees, said Joel Maloff, president at The Maloff Co., a Dexter, Mich.-based consulting firm. But, he points out, this will take a lot of engineering and trust among ISPs.

Service level agreements (SLA) are difficult to establish when traffic goes through a NAP or MAE site. Because private peering establishes a clear, high-bandwidth line between two ISPs, traffic traveling over that connection could be monitored and controlled more closely.

Two providers that offer the same level of packet loss and compatible QoS agreements to their customers could extend their guarantees across both networks, said John Curran, chief technical officer at BBN Planet. "This could only happen with a private interconnection," he said.

That is something that users who are developing Web-based applications clearly want. "We have a product going up in May that will let 20,000 of our 401k clients access their accounts and make transactions through our Web site," said Tod Bryant, director of information systems at New York Life Benefit Services, Inc., a Norwood, Mass.-based company. New York Life has SLAs with its clients, similar to the agreements it has with UUNET, its ISP.

New York Life's competitors are likely to come out with similar Web services for 401k clients, Bryant said. "But if we could extend [performance] guarantees to our clients, this would benefit us competitively." ■

Pay for peering

UUNET Technologies, Inc., a WorldCom, Inc. subsidiary, is shaking up the Internet community with a plan to charge smaller Internet service providers for sending traffic over its network.

The Fairfax, Va.-based ISP told approximately one dozen companies that it will assess what is known as a settlement charge for network access. It has been reported that ISPs notified have peering agreements with UUNET, although UUNET has not revealed how it plans to implement these settlement charges.

In the world of telecommunications, carriers are charged origination and termination fees by local telephone companies for long-distance calls that go through their networks. UUNET, which is owned by the fourth largest long-distance company in the U.S., seems to be adopting a similar strategy.

Joel Maloff, president at The Maloff Co., a Dexter, Mich.-based consulting firm, said it's not surprising that UUNET is the first to try imposing settlements. "It's blindly obvious that WorldCom is infusing [UUNET]," he said. Analysts and ISP executives said the practice will become common.

— Denise Pappalardo

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How I broke my toe and the tale of Jimmy's server

Did I ever tell you how I broke the big toe on my right foot?

Well, it was back in my Novell days. I flew into Dallas from London's Heathrow for the first NetWorld+Interop, and British Airways managed to lose my luggage.

"Sorry, sir," they said with little interest and a definite sneer on the "sir." "We don't know where your luggage is. But don't worry, sir," (with that sneer again). "We'll get it back... real soon."

Real soon turned out to be two days later. British Airways informed me my luggage was in Dallas but would still take six hours to get to me because the delivery truck was rather full. I was, to say the least, ticked off. It was then that I broke my toe—I kicked a chair out of sheer frustration.

After 48 hours, the least the airline could have done was to put my luggage in a taxi to get it to me as fast as possible.

The bottom line: The sad fact is that British Airways simply had no concept of the inconvenience its foul-up was causing me or how bad this type of thing is for the company's image.

The company simply had no concept of the inconvenience its foul-up was causing me.

Now let me tell you about my friend Jimmy DeRouen. Jimmy is a network administrator for ABC-Clio, a publisher in Santa Barbara, Calif. To run the business, ABC-Clio purchased an Intel Altserver from a VAR that had combined its software with the server supplied by an Intel hardware reseller.

All was fine for about a year after installation. But the trouble began when ABC-Clio needed to add more storage. This became one of those nightmare upgrades. We won't dwell on the problems except for one: The added load blew the computer's power supply.

Because the service contract had expired two days before, and ABC-Clio's server was down, Jimmy took things into his own hands.

He opened the box and removed the PSU. He tried three replacements but, for a variety of obscure reasons, none worked.

Jimmy began pulling out his hair.

He wrestled with the requisite Intel red tape and returned the original power supply with the hope that Intel would act appropriately to a failed server crisis.

In fact, Intel cared so much that it was going to take between 21 and 30 days to supply the replacement under warranty.

So Jimmy bit the bullet and purchased a brand-new Intel PSU—because getting a warranty repair this side of the millennium seemed unlikely.

By the time Jimmy got his new PSU 48 hours later, the original hardware vendor had gotten involved and also acquired a warranty replacement unit from Intel.

The odd thing was the new PSU Jimmy got directly from Intel didn't work.

At this point, he gave in and sent the whole server back to the hardware reseller where the reseller installed the replacement PSU and, finally, everything worked.

Now, Intel expected the broken PSU to be returned by the VAR for a warranty credit.

But Jimmy had sent the PSU back to Intel. Could Intel transfer the credit that Jimmy received for returning the PSU to the VAR's account? No such luck. Intel had to send Jimmy the dead PSU so he could ship it to the VAR, so the VAR could ship it back to Intel for the credit.

The bottom line: The sad fact is Intel simply had no concept of the inconvenience its foul-up was causing Jimmy or how bad this type of thing is for the company's image.

If only this story were unusual. But so many of you have written to me with similar tales of woe concerning just about every vendor that I guess vendors in general just don't take their customers' needs seriously.

I'm glad Jimmy's server problems were his and not mine. If I'd kicked that, I'd have broken my whole foot.

Going to Interop this week? Tell me the silliest thing you saw. Contact me at nwcolumr@gibbs.com or (800) 622-1108 Ext. 504. (This week's cigar selection: Thomas Hinds Honduran Selection Corona, which scored 87 by Cigar Afficionado, www.cigaraficiando.com. Yum.)

Mark Gibbs



'NET BUZZ

The latest on the Internet/intranet industry

By Chris Nerney

SWITCH VENDOR SWITCHES TO INTERNET Executives from LAN switching vendor Xedia Corp. last year looked into the company's future and saw a side order of french fries.

This year, they see a major role for Xedia in the broadband Internet access market. That's a big shift in market and strategy. But Xedia is being helped by venture capital firm Greylock Management Corp., which recently sank \$4.8 million into the Littleton, Mass.-based company.

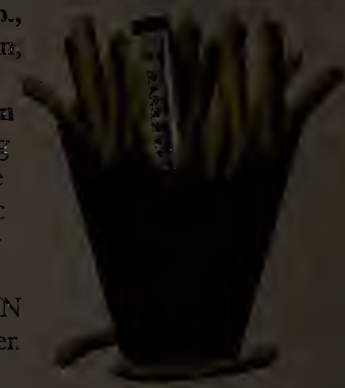
Xedia President and CEO Ashley Stephenson said the decision to abandon the LAN switching market the company has competed in since its founding in 1992 was prompted by a realistic assessment of Xedia's ability to battle the larger switch vendors.

The problem, Stephenson explained, was "LAN switches were becoming a bit like fries with a burger. You're buying a main solution from somebody, and switches can come from Company A or Company B. It doesn't matter, they should all just work."

That market scenario gave the edge to larger vendors such as Cisco Systems, Inc., which could charge customers less for switches, according to Stephenson.

"We recognized we could hang out in that market, but it would be increasingly difficult for a small company to compete," he said.

Xedia is set to launch Access Point, the first in what Stephenson said will be a line of managed broadband access products. Access Point is scheduled to be released next month and will be priced between \$15,000 and \$20,000. Fries are extra.



HOTMAIL IS \$3 MILLION HOTTER Looks like the battle for free E-mail supremacy should go on for a while. HotMail Corp. of Sunnyvale, Calif., recently received \$3 million from Menlo Ventures and Draper Fisher Associates.

While that amount pales in comparison to the war chest of arch rival Juno Online Services of New York, it should be enough for HotMail to avoid the fate of Freemark Communications, Inc., which ran out of money and shut its doors late last year.

Juno, a wholly owned subsidiary of Wall Street investment bank D.E. Shaw & Co., reportedly has spent more than \$20 million to establish itself as the leader in the advertiser-supported free E-mail market.

HotMail, meanwhile, claims it has the edge in a more valuable commodity: subscribers, or "eyeballs." The company said it now has more than 3 million users and trails only America Online, Inc. and CompuServe, Inc. as the Internet's most popular E-mail service. Juno said it has more than 2 million subscribers.

Between them, that's a lot of eyeballs. We just hope this doesn't turn into a staring contest.

NAVIGATING THE INFORMATION AUTOBAHN OK, we love the Internet, but this is going too far.

Only weeks after the release of a Canadian study showing that drivers who talk on cellular phones get in more accidents, the parent company of Mercedes-Benz demonstrates a car linked to cyberspace.

Officials at Daimler-Benz's Research and Technology Center (RTC) in Palo Alto, Calif., last week said the "Cyber Mercedes" is five to 10 years away from hitting the market.

We don't look forward to sharing the road with what RTC calls "The Internet Multimedia on Wheels Concept." In fact, the notion of making an Internet multimedia show available to drivers as they steer two tons of metal down the freeway at 70 miles per hour strikes us as — how can we put this diplomatically — madness.

Hell, why don't we just give them all a couple of tabs of acid and slap a strobe light on the dashboard?

Picking up some good dirt at Interop? Don't keep it to yourself. Tell it to 'Net Buzz; it will help you beat that hangover. Contact Chris Nerney at (508) 820-7451 or cnerney@nw.com.

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Description: Fractional T1 modular multiplexer

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Application:



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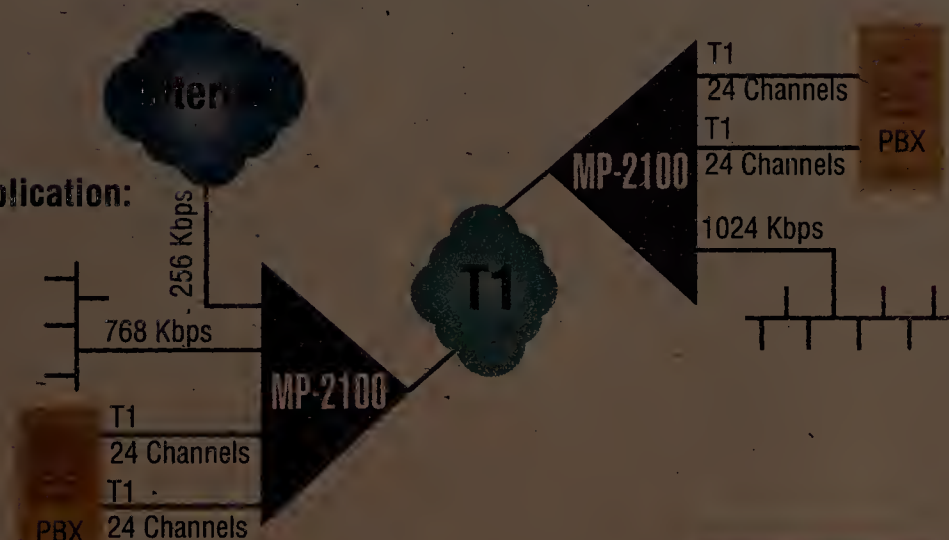


Name: Megaplex - 2100

Description: T1/E1 integrating voice & data multiplexer

Benefit: Flexible modular TDM integrating data, voice, fax, LAN and video over T1/E1 links on fiber, copper, microwave, laser or RF communications. Voice technology expertise: MPMLQ, ADPCM, compression of full PBX T1 and standard PCM. Support of 144 voice channels over a single T1 link. I/O modules for ISDN, routers, DDS and low and high bit rates. Graphical SNMP management with HPOV or Windows/PC platform. Full redundancy with dual aggregate links, power supplies and common logic cards.

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- For the second year in a row, *Network Magazine* (formerly *LAN Magazine*) awarded Cabletron's SPECTRUM enterprise management solution its 1997 Product of the Year in the category of Management Platform.
- In WAN switching, Cabletron's FRX4000 frame relay solution from CSI Netlink won the annual "Tester's Choice" award handed out by *Data Communications*.

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